

Railway Age

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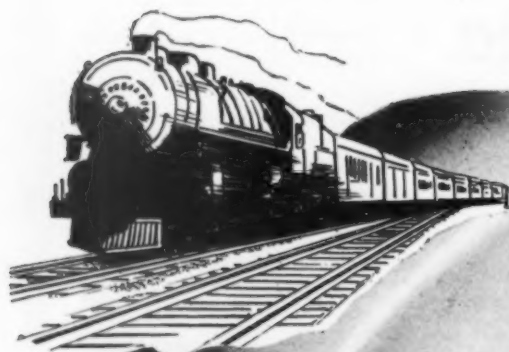
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Railway Age

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Public Opinion and the B. & O. Centenary

WITH railroads celebrating various anniversaries, centennial and of shorter periods, as they have been in recent years, the question of the effectiveness of such activities from a public relations standpoint may arise. A concrete instance comes to mind—i. e., the Baltimore & Ohio's centenary celebration. Some measure of the public interest in this road's plans is afforded by an examination of a pamphlet recently issued. In it are reprinted editorials from newspapers commenting on the B. & O. centennial and its celebration. According to our count, there are in this booklet 154 editorials which appeared in papers in 117 different cities and 32 states. A tabulation of the combined circulation of these newspapers exceeds 4,100,000. This, of course, is not a complete gage of the publicity value of the celebration to the railroad, since news articles are not included in the tabulation. Likewise the tabulation of the editorial comment is incomplete, since probably much more will appear when the Halethorpe exhibition opens in the fall. Without attempting to establish any mathematical ratio between the elaborateness of plans for such celebrations and the volume of public interest aroused, the testimony offered by this booklet is nevertheless quite eloquent. It shows conclusively that there exists still, with all the current interest in automobiles and airplanes, a tremendous fascination in railroading which is generally felt and which needs to bring it into the open only a definite focusing point, such as a celebration of this kind provides. This is a fact of considerable importance to everyone interested in railroad public relations problems.

Eliminating Engineering Mistakes

NO human being is infallible; all are more or less prone to make mistakes. As men assume positions of increasing responsibility and trust, the greater the care they should take to avoid mistakes because the greater responsibility, the more costly the mistakes are likely to become. The mechanical engineer of a railroad should adopt every possible means to avoid mistakes when designing or specifying the materials for locomotives and cars. This is difficult to do when the mechanical engineer must depend solely on his knowledge, plus that of his assistants. His engineering knowledge should be supplemented by that of the men responsible for the maintenance and operation of rolling stock. The mechanical engineer of an eastern railroad, desiring to reduce to a minimum the mistakes made in his department, caused to be formed a general engineering committee composed of the shop superintendents, master mechanics, a representative of the road foremen of engines, and other men holding responsible positions having to do with the maintenance and operation of cars and locomotives. This committee, which

meets quarterly, is presided over by the mechanical engineer. The committee members come prepared with data, drawings and arguments to support their suggestions that certain changes be made either in design or in material specifications. The suggestions made are either discarded as impracticable or are unanimously agreed upon by the committee, and then submitted to the head of the mechanical department for adoption. So far, the recommendations submitted by the committee for approval have always been adopted. During the several years that this committee has been functioning, engineering mistakes have been reduced to a minimum. The records show that the committee has saved the railroad many thousands of dollars.

Selling Automatic Signal Interlockers to Operating Officers

ONE road has just made a study of the benefits to train operation that can be secured by the installation of automatic signal interlockings at six outlying railroad grade crossings where trains are now required to stop. As similar installations have been in service for several years on other roads the signal engineer had no difficulty in preparing plans for the equipment and control circuits to meet the requirements at the several locations. The operating officers of this road have been hesitant, however, to approve the idea of automatic signal protection for railroad crossings, even on branch lines. To overcome this hesitancy it can be pointed out that at least 22 such interlockings were installed in 1926 and that over 80 such plants are now in service in the United States and Canada, under various densities of traffic. Among others, an automatic signal layout replaced a mechanical interlocking at the single-track main line crossing of the Great Northern and a single-track branch line of the Northern Pacific at New Rockford, N. D., about two years ago. The Wabash recently replaced a mechanical plant by an automatic installation at its double-track main line crossing with a New York Central single-track line near Adrian, Mich. At both of these points levermen were released for three tricks. At Delmar, Iowa, the Chicago, Milwaukee & St. Paul installed an automatic signal interlocking at a crossing of its main double-track line with a branch line of the Chicago & North Western and trains are no longer required to stop on an adverse grade, while protection is secured with minimum cost for the plant and without expense for levermen's wages. Other examples could be cited but the point is that for simple railroad crossing layouts where switching moves are not involved, the principle of the automatic signal interlocking is proving successful from both the engineering and operating view points. Any road on which the engineers are well disciplined in the observance of signals need not hesitate further in the installation of automatic signal interlockings where they are adaptable.

Yard Wastes and Leakages

PROBABLY in no other railroad activity is there such ample opportunity for wasting time as in yard operation. Men on the road are under the control of the dispatchers and a ready check is available of their performances. Similarly, men in the shops are under the eye of their supervisory officers more or less constantly. But, in a yard, particularly a large one, the situation is somewhat different. There is so much to do off in the far corners, away from the supervisory eye, and so many ways in which it can be done improperly so as to result in time leakages, that it behooves the yard supervisory force to be unusually attentive. Even this is not sufficient. The yard supervisor must not be content merely with seeing that the work is done as promptly as possible according to the methods in vogue. He must study constantly to improve his methods. General supervision of all yards of a system, when delegated to one experienced man, has proved helpful in aiding the local men in ironing out their individual problems, as well as those common to all the yards. In an article appearing elsewhere in this issue, the general supervisory method employed successfully by the Rock Island is described. By a system of reports the chief of yard operation is enabled to keep a close check on all yards, with records of their comparative performances. Any lessening of efficiency in any yard on the system is disclosed in these reports as clearly as a red block in automatic signal territory, and the necessary remedies may be and are applied at once. The Rock Island plan also shows what may be done in the way of eliminating time leakages under competent and alert supervision. The savings effected have been found to be well worth the effort and expense of installing and maintaining the system.

Dispatcher's Responsibility for Track Motor Cars

WITHIN the last few weeks a number of accidents have occurred in which track motor cars have been struck by trains and men have been killed. In the investigation of these accidents it has been found in several instances that the men operating the cars were running with "line-ups" secured from the dispatchers which were incomplete either in that they failed to locate the trains accurately or, more frequently, in that certain "extras" were not mentioned. No dispatcher would be tolerated who was guilty of such inaccuracies in the handling of trains. Yet such errors are frequent in the information furnished track motor car operators. The record of accidents from this cause demonstrates that many dispatchers do not take their responsibility with reference to the track motor car sufficiently seriously to afford the operators of these cars the protection that they need. The track motor car has demonstrated its efficiency so thoroughly that it is now almost universally employed as a standard unit of maintenance equipment. In their routine duties foremen have frequent occasion to use the car for the movement of men and materials over their territories. Where the view is obscured, it is a common practice for them to ask the dispatcher for a "line-up" in order that they may know what train movements they have to watch for. The dispatcher owes it to these men to give them an accurate line-up and division officers should insist that this be furnished. Only when supervisory officers place the same emphasis on the accuracy of the information furnished track motor car operators by dispatchers as they place on the issu-

ance of train orders themselves will track forces receive the protection that their work requires and this cause of accidents be eliminated.

Improved Prospects in Northwestern Region

PEOPLE interested in the railroads of the northwestern region seem to be evidencing more optimism regarding conditions in that region than for an extended period of time. The reason is a decidedly promising crop condition made possible by a much greater quantity of moisture than has existed for some time. This same excess of moisture prevented early planting, particularly of corn, in the northern Mississippi valley states, but the result further west, notably in the spring wheat states and in the winter wheat areas of the Northwest has been to give a favorable moisture condition such as the Northwest has not had for several years. One report states that the stand of spring wheat in South Dakota is very heavy. Another says that the uniformity of the spring wheat stand in the Northwest is noteworthy. Favorable reports come in regarding the prospective corn yields of south Dakota and Minnesota and concerning the winter wheat prospects of the more western grain areas. It is stated that general crop conditions from Chicago to the North Pacific coast are "good," particularly so in Nebraska, Montana, Washington, Idaho and Oregon. General business, it is stated, is not good, but it is hoped that the stimulus of the coming crop will make it better.

The railroads of the Northwestern region have reported less net railway operating income in the first five months of 1927 than in the corresponding period of 1926 and, up to the end of May, the return on their investment was only 2.18 per cent. Notwithstanding this fact investors are showing a much more favorable opinion of the securities of the northwest roads than formerly. They appreciate that this region reports only about one-fourth of its year's net operating income in the first five months of the year and that great weight must be given to the prospects for the latter months of the year.

The evidence of stock market opinion is given in the prices of the stocks of the leading northwestern carriers. Thus, Great Northern preferred, which pays 5 per cent dividends, reached a new high price for 1927 of 95 on July 19, an increase of 15 points over the low price quoted in January. Northern Pacific common, also a 5 per cent stock, reached a high of 92¾ on July 20, showing an increase of 14 points since the first week of January. These prices in each case are slightly above the prices quoted for the certificates representing the stock deposited in connection with the merger plan of these two carriers. Chicago & North Western common now pays 4 per cent. It reached a high of 92½ on June 6, is now selling at 89¼ and the present price is about 11 points over the low price for the year on January 27.

Some say that the Northwestern carriers need higher rates; some that they need more traffic; while some believe they need both. The expectation is that 1927 will yield the increased business. This without the first will not permit the earnings for the year to approach a fair rate of return of 5¾ per cent, but it does bid fair to let the region rise from its position of reporting the lowest rate of return for any region as it did in 1926, 1925 or 1924. Furthermore, the roads mentioned are so conservatively capitalized that the earnings per share should show a decided improvement.

The Shoemaker to His Last

AN old Latin proverb, expressed centuries before this age of high specialization in every field of endeavor, may be freely translated to the effect that a shoemaker is not competent to judge or to pass upon things beyond his last or above the shoe—in other words, matters upon which he is not well posted and trained.

Labor union leadership is a highly specialized vocation; indeed, some of its more progressive leaders are doing much to raise it to the standard of a profession. Americans have witnessed many instances of men or organizations who have made an outstanding success or reputation in one field attempting to broaden their activities and direct enterprises concerning which they have had no special experience. In not a few instances their failures have been so complete as to be almost pathetic.

For many years the locomotive engineers had taken a certain justifiable pride in the dignity and conservatism of their organization and its leadership. A change of leaders, however, brought it into a peculiar and strange position—it began to become entangled in all sorts of radical movements and at the same time entered on a large scale into the fields of finance and industrial management. The combination was difficult to understand and to follow. Here was one of the leading labor union organizations with a reputation for conservatism becoming the manager of several industrial enterprises, including a coal mine, the manager of a series of banks and financial enterprises, while at the same time its leaders and its official organ were boosting La Follette and apparently doing everything they could to discredit the railroad managements and bring about government ownership. Could such a combination continue to prosper or even to exist? Could men who had received their training as labor union leaders successfully direct such enterprises even though they might retain men under their control who had received special training in their management?

The answer was given in no uncertain terms at the triennial convention of the brotherhood at Cleveland. Apparently the rank and file of the organization, which averages high in character and intelligence, have at last found a way of expressing themselves and of taking over the leadership of their organization. The exponents of radicalism have been given a severe lesson, as is instanced by the withdrawing of support from the publication *Labor*. It is to be hoped that this action on the part of the convention will be reflected in a change in the editorial policy of the brotherhood's own journal. A sweeping change in the organization puts it on its former basis of administration and, instead of extending its outside activities, promises to restrict them in the attempt to safeguard and conserve the strength and resources of the brotherhood. Whether it will be able to avoid embarrassment on this restricted basis remains to be seen. Indications are, however, that the members at large are unwilling to continue to support policies and programs which cannot be fully justified on a sound economic basis, or which may lead to embarrassment in brotherhood activities.

That the financial problem, said to be caused by frozen assets, is a bitter pill to swallow is indicated by the fact that the convention found it necessary to strengthen the brotherhood's assets by arranging for the issuance of certificates of deposit to its members, which will be voluntarily subscribed for and by which it is hoped to raise approximately seven million dollars. This excursion of the Brotherhood into industrial management and finance, therefore, again justifies the old adage that the shoemaker should stick to his last.

The Passenger Station and the Automobile

THE most difficult problem in laying plans for any railway improvement is to determine what provision should be made for the future increase in the service which must be rendered by the facility under consideration. Of even greater difficulty is the task of anticipating changes in the character of the service or increases in the size, length or weight of the railway equipment or trains to be accommodated. Thus, round-houses, turntables, bridges and locomotive shops have become obsolete as often by reason of the increase in the size or weight of the units to be accommodated as because of an increase in the number of units.

A somewhat similar situation confronts the railroads with respect to passenger stations. Passenger travel as a whole has decreased during the last ten years, although there has been some increase in passenger business between large cities. There would seem, therefore, to be less need for increased capacity of passenger stations than in almost any other class of railway facilities. However, changes have taken place in the nature of the use of passenger stations which have resulted in a marked inadequacy of certain facilities. Ten years ago the railroads were confronted with the need for an enlargement of railway mail facilities by reason of the sudden growth of the parcel post business. At the present time, the very influence which has been responsible for the marked loss in passenger business, namely the highway motor vehicle, is also the cause of one of the most glaring deficiencies experienced in passenger stations today in the form of inadequate accommodations for taxicabs and private automobiles waiting to discharge or receive passengers. As a consequence, the facilities provided for this purpose in some of the newer stations have assumed an importance entirely undreamed of 15 years ago, while extensive alterations are being made in existing stations, in an endeavor to overcome the congestion at the stations as well as in the streets approaching them.

While the private automobile is not much in evidence at the metropolitan passenger stations today, there has been a feeling on the part of some railway officers that the congestion in the streets approaching stations and at landing areas, as well as the lack of parking space, is discouraging passenger travel. One evidence of this is to be found in the special provisions for parking in the plans for the Reading's new Philadelphia station.

While this new factor in railway travel has assumed the greatest importance in passenger stations of large cities, it has also developed some perplexing situations at the more important suburban stations where commuter travel by train is supplemented by the use of the family automobile between the station and the home. The development of parking areas to meet the needs brought about by this change in mode of transportation has immediately given rise to parking for long periods by persons who are not patrons of the railroad.

Consideration of these problems raises pertinent questions as to the line of demarcation between the responsibility of railroad and public authorities in the provision of facilities for street vehicles. However, it is a matter which railway managements cannot face with any degree of complacency because the very condition of congestion on streets and highways which should serve to restore to the railroads much of the traffic which has been lost to them during the last ten years may, in turn, militate against this tendency by reason of the obstruction it imposes to access to the stations.

Car Load Minimums

THE problem of increasing the average loading of freight cars presents an opportunity for another fine demonstration of the advantages that may be derived by both railways and shippers from frank and intelligent discussion between them and sincere co-operation to give effect to the conclusions upon which they agree.

The board of directors of the American Railway Association at a meeting in May, adopted, on the suggestion of the Car Service Division, a program for further increasing efficiency in the use of freight equipment, including heavier loading of cars. This program is being presented to the Regional Shippers' Advisory Boards, with requests for its endorsement by them.

Experience has made many shippers suspicious and antagonistic toward suggestions of heavier loading. Their attitude, and the reasons for it, were set forth clearly and ably by J. H. Beek, executive secretary of the National Industrial Traffic League, in a letter to R. C. Ross, chairman of the Mid-West Shippers' Board, which was read at the recent meeting of this board. Mr. Beek said, "it looks very much to me as though the (railway) operating officials were paving the way for the traffic men to come forward and ask for increased minimum weights on carload shipments. * * * The whole tendency of the time is 'hand-to-mouth' buying. * * * Maximum loading is desirable in many lines, such as iron and steel, coal, lumber, etc., but loading of merchandise beyond a reasonable minimum weight is impracticable. * * * The attitude of the railroads seems to be that the shippers must incur whatever expense is necessary to load cars heavily to suit the operating notions of the railroad management, but the railroads themselves must not be put to that expense in the loading of their own cars" with company freight. These expressions of Mr. Beek are especially significant because he always has strongly and outspokenly favored co-operation between railways and shippers, and advocated a fair and liberal policy of railway regulation.

His letter was commented on in a statement made by M. J. Gormley, chairman of the Car Service Division, who said, "Our endeavors to increase the load per car have absolutely no relation to the question of tariff minimums," and added, "The results that ought to be accomplished will only be brought about by co-operation between shippers and railroads and a thorough realization on the part of the public that everything they do to bring about a more economical use of equipment is directly in their own interest, and it will never be accomplished by attempting to force an increase in the tariff minimums in opposition to the expressed desire of shippers."

The result of the discussion was the unanimous adoption by the Mid-West Shippers' Board of a resolution endorsing the program of the American Railway Association, "provided that this co-operation on the part of shippers will not be construed as an endorsement nor a leverage to increase minimum weights beyond commercial necessities."

Spokesmen of the railways often have insisted that good transportation service is of much more importance to shippers than the difference in rates necessary to enable the railways to render good rather than poor service, but what has been meant by "good service" usually has not been definitely stated. Developments within recent years, resulting in a vast reduction of business inventories with consequences of great economic and financial magnitude and importance, have given to the term "good service" as applied to transportation a meaning so much broader than formerly that it may almost be said to be a new meaning. Really good service, we have found, includes furnishing shippers all the cars they need when

and where needed, moving their loads promptly and speedily to destination, keeping shippers informed as to where the loads are, reducing loss and damage to the practical minimum—in other words, so doing everything falling within a broad interpretation of the common carrier's functions as to enable the country's production, commerce and finance to be conducted with the greatest possible success.

The rendering of the best practicable service requires that the needs and reasonable demands of every class of shippers and receivers, whether their individual businesses be large or small, shall be heeded by the railways. Involved in this is frank recognition of the fact that some commodities can be shipped in heavy carloads and others cannot, and especially that some shippers and receivers can profitably ship and receive maximum car loads of certain commodities while others cannot ship and receive maximum car loads of the same commodities without carrying excessive inventories and incurring excessive expense on that account. Maximum economy in railway operation would require maximum loading of all cars, but this is a commercial impossibility, and Mr. Beek was right in contending that the primary consideration is not the utmost economy in railway operation, but meeting the commercial needs of shippers and receivers. The object of the railway management should be merely the most economical operation consistent with the rendering of "good service" in its broadest meaning.

How is this to be attained? Mr. Gormley indicated the way in his statement. The railways should replace obsolete equipment with cars big and strong enough to handle in large car loads all the freight that can be handled in such loads. Their managements should exercise the greatest vigilance and ingenuity in preventing the dead weight of these cars from being made excessive, and, as Mr. Gormley remarked, the modern 100,000 lb. capacity box car, A. R. A. standard design, weighs about 3,000 lb. less than the 80,000 lb. capacity car formerly built by some roads and by the Railroad Administration. As the railways provide larger and better cars shippers and receivers should, with due regard to the conditions under which each of them must do business, co-operate by loading cars as heavy as practicable because this will effect economies in railway operation by which in the long run the railways, their employees, shippers and the public will all benefit. Meantime, pressure for increases in minimum car load weights should not be applied unless by agreement between the railways and the shippers and receivers resulting from frank conferences and discussions in Shippers' Advisory Board meetings throughout the country.

Railways and Shippers Have Same Interest

There is no necessary antagonism of interest between the railways and the shippers regarding the loading of cars, or anything else, for that matter. Large economies in operation tending to bring about lower rates can be effected by heavier loading; but the freight rates the shipper pays are but one of the expenses he must incur in conducting his business, and usually only a small expense compared with the cost of carrying his inventories. Therefore, usually he would much better pay rates high enough to compensate the railway for rendering good service in the broadest sense than lower rates made possible by economies accomplished by heavy loading at the cost of making it necessary for him to carry relatively large inventories.

Our transportation experience within recent years, as we have intimated above, has given those who have really learned its lesson a greatly broadened conception of the part that transportation can and should play in modern production, commerce and finance. The grand objective

of all engaged in transportation, production, commerce and finance should be the conducting of the business of the nation as a whole with the greatest practicable efficiency and economy. The experience mentioned has shown that the railways can best contribute toward this result, first, by being enabled to render, and by rendering, a service that meets all the reasonable demands of production and commerce, and, secondly, by rendering that service as economically as possible. For railway managements to put economy in transportation before service would be to make substantially the same mistake that shippers and regulating commissions so often have made and still make in insisting upon unreasonably low rates in ignorant disregard of the inevitable tendency this must have to make service inadequate and poor and a cause of ultimate disaster to production, commerce and finance.

Capital Expenditures Since 1921

THE tendency of most railways to spend relatively more at present for the improvement of roadway and other permanent structures than for new equipment is shown by statistics regarding the capital expenditures of the Class I roads in the first three months of 1927 which were made public by the Bureau of Railway Economics last week. The figures show that during the first quarter of this year over 64 per cent of capital expenditures were made upon roadway and permanent structures and less than 36 per cent for equipment.

The accompanying table gives the capital expenditures made for various purposes during the five years ending with 1926, during the single year 1926, during the first quarter of 1927, and also the percentage of the total that each class of expenditures was of the total during each of these periods:

Capital Expenditures, Five Years, Year 1926 and First Quarter, 1927

	5 Years, 1922-1926		Year, 1926		First Quarter, 1927	
	Amount	Per cent	Amount	Per cent	Amount	Per cent
Equipment:						
Locomotives	\$520,834,934	13.0	\$108,263,000	12.2	\$19,771,000	12.8
Freight-train cars	1,313,204,968	32.9	185,792,000	21.0	18,192,000	11.7
Passenger-train cars	210,606,017	5.3	58,117,000	6.6	12,346,000	8.0
Other equipment	86,231,729	2.1	19,750,000	2.2	5,037,000	3.2
Total equipment	\$2,130,877,648	53.3	\$371,922,000	42.0	\$55,346,000	35.7
Roadway and structures:						
Additional track and track material	\$588,312,155	14.7	\$166,758,000	18.8	\$30,145,000	19.4
Heavier rail	151,913,975	3.8	42,184,000	4.8	8,275,000	5.3
Shops and engine houses	182,910,172	4.6	46,882,000	5.3	10,941,000	7.1
all other	942,428,802	23.6	257,340,000	29.1	50,315,000	32.5
Total roadway and structures	\$1,865,565,104	46.7	\$513,164,000	58.0	\$99,676,000	64.3
Grand total	\$3,996,442,752	100.0	\$885,086,000	100.0	\$155,022,000	100.0

On the basis of figures now available the Bureau of Railway Economics estimates that total capital expenditures during 1927 will be \$700,000,000 to \$750,000,000. The annual average for the last five years was \$799,300,000. During this entire period in 1926, and also in the first quarter of 1927, the expenditures for locomotives were about the same proportion of the total, or approximately 13 per cent. The most marked decline, relatively, has been in expenditures for freight cars. This averaged almost 33 per cent of the total during the last five years, but was only 21 per cent of it in 1926 and less than 12 per cent in the first quarter of 1927. Undoubtedly the explanation of this is to be found in the freight car surplus which has existed since the early part of 1923 and usually has been large. In view of the decline that has occurred in passenger business, it seems somewhat paradoxical that the proportion of capital expenditures made for passenger cars should be increasing. It is a fact, however, that during the last five years it was only 5.3 per cent, while in 1926 it was 6.6 per cent and in the first quarter of 1927

it was 8 per cent. In the entire five years there was spent for all kinds of equipment almost \$2,131,000,000, or 53.3 per cent of the total capital expenditures made. In 1926, however, only 42 per cent of these expenditures were made for equipment, and, as already indicated, in the first quarter of 1927 less than 36 per cent. The equipment acquired in the five years 1922-1926, inclusive, and the first quarter of 1927, included 743,318 freight cars and 12,818 locomotives.

The relatively large size of the expenditures made in 1926 and in the early part of 1927 for improvements of roadway and permanent structures becomes clear when the figures for these periods are compared with those for the five years ending with 1926. In these five years less than 47 per cent of capital expenditures were made upon roadway and permanent structures, but improvements in roadway and permanent structures took 58 per cent of the expenditures in 1926 and, as already indicated, over 64 per cent in the first quarter of 1927. Of the total expenditures for equipment during the last five years only 17.5 per cent were made in 1926, while of the five years' total for roadway and structures no less than 27.5 per cent were made last year.

It has been only a comparatively few years since many students of railway operation began to contend that the railways had made improvements in and additions to their equipment faster in proportion than in the fixed properties, and that, to enable them to handle the equipment with maximum efficiency, they needed larger and better equipped locomotive terminals, longer passing tracks, larger yards, more block signals, etc. Capital expenditures for locomotives and freight cars in 1923 were relatively very large owing to the condition of equipment when the railways were returned to private operation and to the deterioration in it that occurred as a result of the shop employees' strike in 1922. It is

beyond question that the relatively large expenditures made within recent years, and still being made, on permanent structures deserve much of the credit for the more effective utilization of equipment.

Manufacturers who sell to railways naturally are speculating as to how long present tendencies in capital expenditures will prevail. They recently have been and are now affording a large market for manufacturers of materials used in improving and enlarging permanent structures, while the equipment manufacturing business, and especially that part of it especially concerned with freight cars and specialties used on them, has not lately been prosperous. While the railways have ample equipment to handle their present business, there can be no doubt that much of it is so old and even obsolete that it would be in the interest of economy in both maintenance and transportation to replace it with new and modern equipment, and it seems not improbable that if freight business continues to be good or gets better expenditures for equipment will increase relatively to those for other purposes.



General View of Yards at Denison, Tex.

Missouri-Kansas-Texas

*Increase in traffic and improved efficiency of operation
bring earnings of \$6.00 on common stock in 1927*

THERE are at least two reasons for being interested in the Missouri-Kansas-Texas at the present time. One is the earnings statement for the first five months of 1927, showing an increase in net income after interest and other charges of 22½ per cent as compared with the same period of last year. Another is the impending announcement of Mr. Loree's revised plan for the joining together in a single southwestern system of the Katy, the Cotton Belt and the Kansas City Southern. It is expected that in this plan, in the effort to meet the recently announced views of the Interstate Commerce Commission, the Katy will be made the parent company or nucleus in place of the Kansas City Southern as provided in the plan that was rejected by the federal regulatory body.

The Katy operates a total of 3,188 miles of line. Its lines extend from St. Louis and Kansas City across Oklahoma and then across Texas as far south as San Antonio, Houston and Galveston. These supplement considerably more than they compete with the mileage of the Kansas City Southern and the Cotton Belt, the Katy's two sister lines in the proposed new Loree system. The Katy does, however, meet the strongest kind of competition from the Frisco, the Texas and Oklahoma lines of which serve this same territory although having a greater development in Oklahoma as distinguished from the Katy's greater development in Texas. Both railroads have benefited in a remarkable degree from the oil development of this territory and both in recent years have shown a similar remarkable improvement in earning power and operating efficiency as indicated by their earnings and operating statistics and the service which they render shippers. The class of service given by the Katy is such as to permit fourth-day delivery at San Antonio of merchandise cars from St. Louis, 1,038 miles, and third-day from Kansas City, 787 miles, with corresponding deliveries at intervening points.

The Katy has reported, furthermore, that in 1926, 96.7 per cent of all its scheduled merchandise cars

arrived at their destination on time; in 1925 the on-time arrivals were 98.1 per cent and in 1926, 98.5 per cent.

History

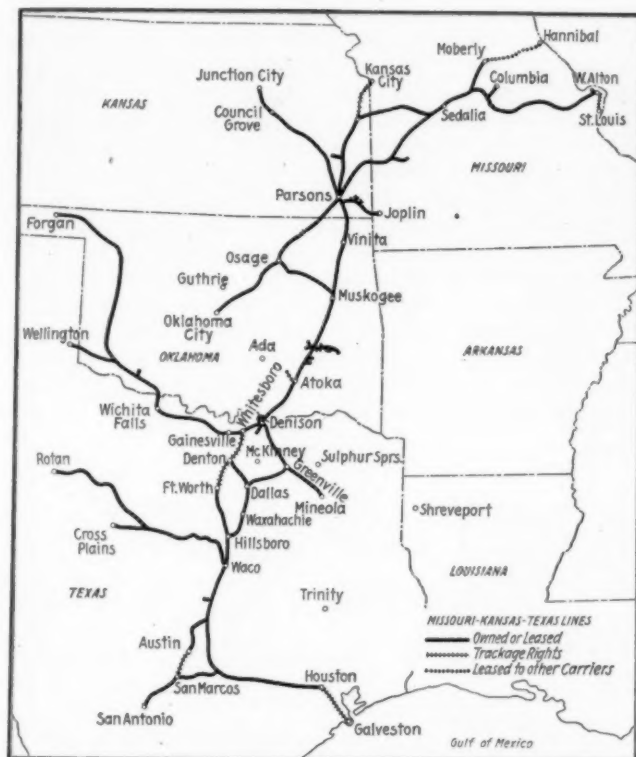
The Missouri-Kansas-Texas, like most of the southwestern railroads, has had a rather checkered career. It had its inception as the southern branch of the Union Pacific. The first part of the line built was that from Junction City, Kan., to Parsons. The new company ran the first train into Oklahoma and after crossing the Red river into Texas in 1872 it ran the first train into Texas from the north, these facts permitting the railroad to claim the honor of being the pioneer railroad in the southwest. In 1880, the new line fell into the control of the Goulds and was leased for a time by the Missouri Pacific up to a receivership in 1888 following which the road was reorganized free from Gould control. The succeeding company, although handicapped by the slow development and then unpromising character of its territory, did, however, become sufficiently prosperous so that from 1906 to 1913 it was able to pay 4 per cent dividends on its preferred stock.

Reorganization

In 1915, however, it was again in receivership and was not reorganized until April, 1923. The period of receivership was characterized by an unusual amount of physical rehabilitation effected by the spending of some \$40,000,000 for additions and betterments. The 1923 reorganization was peculiar in some respects. First, the new company took over only 3,200 miles of the old company's 3,800. Second, the funded debt was increased by \$11,000,000 but there was included \$57,500,000 5 per cent adjustment mortgage bonds, interest on which was to be payable only if earned but cumulative after January 1, 1925. These bonds further carry the privilege of conversion into preferred stock par for par prior to January 1, 1932. The preferred stock is entitled to 7 per cent dividends which dividends do not become cumulative until after January 1, 1928. The

preferred is redeemable at 110. The plan also called for the issuance of no par value common stock.

The combination of increased efficiency made possible by the development of the property during the receivership and the improved traffic made possible by the oil and corollary development of its territory permitted the Katy to fulfill with marked success the terms of the plan of reorganization. Thus, it was found possible to



The Missouri-Kansas-Texas

make the first interest payment on the adjustment mortgage bonds immediately upon the taking over of the property by the new company, namely in April, 1923, and the interest payments have been continued regularly since. The dividends on the preferred stock were commenced in February, 1925, at an annual rate of 5 per cent and in May, 1926, the rate was increased to 6. The earnings on the property for the past two years have been such as to equal, after allowance for the interest on the adjustment mortgage bonds and for full 7 per cent payments on the preferred stock, \$5.33 a share on the no-par-value common.

Present Capitalization

On December 31, 1926, the Katy had outstanding in the hands of the public \$92,541,749 mortgage bonds, \$756,900 equipment trust obligations and \$50,825,764 income mortgage bonds. Up to the present time about

\$5,000,000 of the income mortgage bonds have been converted into preferred stock. Most of this conversion has taken place fairly recently following upon the raising of the preferred dividend rate to 6 per cent and more is, of course, expected to follow when the dividend rate is raised to 7. In 1926, the amount of bonds converted totaled about \$3,400,000. The preferred at present outstanding in the hands of the public totals \$29,328,300 and the number of common shares outstanding in the hands of the public at the end of 1926 totaled 807,565.

In 1923, the new company's first year, the property reported net income after fixed charges, and after the interest on the adjustment mortgage bonds, and after allowance for the full 7 per cent preferred dividends equivalent to \$1.16 a share on the no par value common stock. In 1924, the net income was increased to \$4.72 a share. In 1925, the net income totaled \$6,117,620 or \$5.33 a share and in 1926, \$6,357,468 which, although larger, was still equivalent to \$5.33 a share on the common stock due to the larger amount of the preferred stock outstanding in place of 5 per cent adjustment mortgage bonds.

1927 Earnings

Inasmuch as the Katy has reported net income for the first five months of 1927 about 22½ per cent greater than that for the first five months of 1926, it appears probable that the earnings this year will greatly exceed those of last year. The current estimate of per share earnings on the common for this year is \$6. This figure has to be extremely tentative because of lack of knowledge of

Table II—Revenues and Expenses, June, 1927, and 6 Months' Period

	MONTH OF JUNE, 1927		
	1927	1926	Increase or decrease
Mileage operated (average).....	3,188.54	3,188.54	.....
Operating revenues	\$4,218,336	\$4,500,303	—\$281,968
Operating expenses	3,362,219	3,216,388	145,831
Available for interest.....	839,618	945,699	—106,081
Interest charges, including adjustment bonds	539,531	590,581	—51,050
Net income	300,087	355,118	—55,031
SIX MONTHS ENDED JUNE 30, 1927			
Mileage operated (average).....	3,188.54	3,188.54	.....
Operating revenues	\$27,496,621	\$25,968,287	\$1,528,334
Operating expenses	19,773,537	18,441,437	1,334,100
Available for interest.....	5,749,609	5,454,818	294,791
Interest charges including adjustment bonds	3,350,975	3,544,539	193,564
Net income	2,398,635	1,910,279	488,355

how great a proportion of adjustment bonds may be converted into preferred stock during the year.

The company's preferred stock is at present selling at about 105½, giving a yield, on the basis of the 6 per cent dividends now being paid, of 5.7 per cent. The stock has been as high this year as 106½, which price was reached on July 14 and on January 4 it sold at 95¾. The price range of this issue from 1923 to 1925 was from 24¾ to 92½. The common stock is now selling at about 51½. It has had a range this year between 31½

Table I—Missouri-Kansas-Texas Lines, Operating Results, Selected Items, 1916 to 1926

Year	Mileage	Revenue ton-miles	Revenue passenger miles	Revenue per ton-mile, cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges
1916....	3,865	2,413,801,000	413,950,000	1.03	36,733,682	29,439,701	7,293,982	80.14	.....	—1,134,634
1917....	3,866	2,986,316,000	467,764,000	0.97	43,344,150	33,146,111	10,198,040	76.47	.....	1,379,573
1918....	3,861	3,263,766,000	561,969,000	1.10	54,138,799	47,329,033	6,809,766	87.42	.....	—1,457,793
1919....	3,839	2,978,281,000	626,525,000	1.39	61,825,376	56,986,896	4,838,481	92.17	.....	207,336
1920....	3,793	3,312,953,000	658,772,000	1.43	72,914,737	69,880,879	3,033,858	95.84	—1,147,835	—2,509,099
1921....	3,784	2,761,318,000	412,496,000	1.59	63,020,975	50,055,784	12,965,191	79.43	8,780,928	5,901,349
1922....	3,737	2,546,598,000	319,163,000	1.54	55,035,702	39,683,701	15,352,001	72.11	10,395,020	4,117,478
1923....	3,360	2,789,306,000	335,122,000	1.43	55,987,918	43,628,319	12,359,599	77.93	8,809,589	2,734,921*
1924....	3,193	3,068,948,000	311,585,000	1.38	57,309,345	39,732,035	17,577,310	69.33	12,587,498	5,508,438*
1925....	3,189	3,317,095,000	279,287,000	1.32	57,492,914	39,618,128	17,874,785	68.91	12,825,624	6,117,619*
1926....	3,189	3,432,552,000	264,990,000	1.31	58,100,766	39,979,070	18,121,696	68.81	13,000,263	6,357,468*

*After interest on adjustment bonds.

and 56½. It is rather interesting in this connection that in 1923 its price range was between 9¼ and 17.

A study of the Missouri-Kansas-Texas shows that the two chief factors that have enabled it to meet the requirements of its reorganization plan so readily have been the development of the oil traffic and the general development of the Texas and Oklahoma territory, combined with a remarkable showing of operating efficiency.

Traffic Increase

With reference to the traffic, it was noted above that the railroad now has 600 miles less line than it had prior to its reorganization. Notwithstanding this fact its revenue ton-miles in 1926 showed the same increase over its revenue ton-miles for the year ended June 30, 1916, as was shown for the entire Southwestern region, namely, 58 per cent. It also appears that while the abbreviated Katy had an increase of 58 per cent in its total revenue ton-miles, its revenue ton-miles per mile of line, or its traffic density, increased 91 per cent. Even a comparison with 1920 will show an increase of 23 per cent. The importance of oil in this traffic increase is shown by the fact that refined petroleum and its products in 1926 totaled 22.69 per cent of the total revenue traffic, whereas for the year ended June 30, 1916, the percentage of oil traffic was only 4.69 per cent. The refined petroleum tonnage shows an increase of six times. The development of Texas and Oklahoma has not been entirely in oil, however important that may be. This is indicated in the Katy figures by the fact that the tonnage of manufactured products other than refined petroleum since 1916 has doubled.

Increases in Net

From the standpoint of its revenue per ton-mile, the Katy has had a very mediocre increase, the figure for 1916 being one cent while that for 1926 was only 1.31 cents. This increase of 31 per cent compared with an increase of 41 per cent for the southwestern region. However, the property had a standard return for operations during federal control or average annual net railway operating income for the three years ended June 30, 1917, of \$6,656,207. Its net railway operating income in 1926 was \$13,000,000 which was an increase of 95 per cent and which compared with the increase in net railway operating income for the entire southwestern region of 56 per cent.

Operating Efficiency

A whole article could be devoted to the single subject of the Katy's improved efficiency of operation. Some figures of what has been done, however, can briefly be given in the form of the ratios of operation as compared with those of the Frisco, the Missouri Pacific and the southwestern region.

Per Cent of Railway Operating Revenues

	Missouri-Kansas-Texas	St. Louis-San Francisco	Missouri-Pacific	Southwestern Region
Maintenance of way.....	13.46	13.46	15.87	15.58
Maintenance of equipment..	19.28	19.07	19.80	18.55
Transportation	30.34	33.07	35.44	34.24
Total	68.81	69.83	76.76	74.19
Net operating income.....	22.4	24.6	15.2	17.94

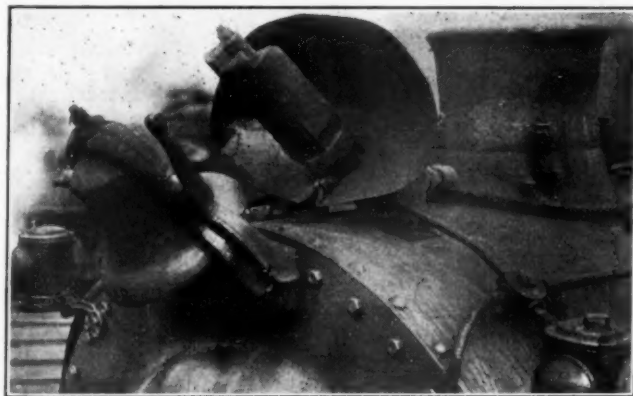
A particularly striking feature is the fact that the Katy operating ratio in 1926 was 68.81 as compared with the Frisco's 69.83, the Missouri Pacific's 76.76 or the Southwestern region's 74.19. The Katy is also in the lead in this comparison from the standpoint of the transportation ratio, its figure of 30.34 comparing with the Frisco's 33.07. The Katy does not come through quite as well on a comparison of the proportion of its total

operating revenues carried to net railway operating income because in this case it ranks second in this group. Thus its figure of 22.4 compares with the Frisco's 24.6, the discrepancy being due largely to the latter's lower charges for rents, but either is considerably better than the 17.94 reported for the Southwestern region as a whole.

Lack of space prevents presentation of the usual comparison of operating statistics which in the case of the Katy would be more complicated than usual because of the change in the mileage of the system and the fact that figures for the Katy's Texas lines are reported separately. However, the operating statistics do show that the northern lines of the Katy reported the highest figures for the Southwestern region for freight cars per train, gross tons per train and gross ton-miles per train hour and that there were only two roads which bettered it in net tons per train, train speed or net ton-miles per train hour. Both the Katy and the Katy of Texas reported figures in all instances better than the averages for the region. The Katy figure of the equivalent 99 lb. of coal per thousand gross ton-miles for 1926 compared with 124 for the Southwestern region and was the lowest figure reported for any railroad in the country with three exceptions. The Katy of Texas reported a figure of 107.

C. & E. I. Experiments With Front End Whistles

THE Chicago & Eastern Illinois has been experimenting with a front end whistle arrangement of the type proposed by Arthur L. Foley, head of the department of physics, Indiana University, Bloomington, Ind.* These tests were begun during the sum-



Clearance Limitations Required Tilting the Whistle at About 45 deg.—The Sound Is Reflected by the Bowl Shaped Sounding Board

mer of 1926 when a Pacific type locomotive was equipped with two whistles, one of which was located in front of the stack as shown in the illustration, and the other was located in front of the cab according to the usual practice.

The front whistle on this locomotive is of the C. & E. I. standard steam operated type but is operated by air. A sounding board of sheet metal formed with a modified parabolic contour is installed immediately back of the whistle as shown in the illustration. This sounding

*See "Study of Locomotive Whistles," by Arthur L. Foley, *Railway Age*, December 5, 1925.

board is 30 in. wide by 24 in. in height and the whistle is so located that its sounding bell is as near the focal point of the reflector as possible. It was necessary to tilt the whistle forward to an angle of about 45 degrees because of clearance limitations. This locomotive is also equipped with a steam blown whistle of the same size type which is located in front of the cab. Both of these whistles are manually operated from the cab and either may be used at the discretion of the engineman.

During the summer of 1926 this locomotive was run continuously in passenger service and the results of a number of tests made during and since that time show that there is a decided advantage in favor of the front end whistle equipped with a sound reflector as compared to the whistle located directly in front of the cab. A number of tests were made on a line of straight track to determine the relative efficiency of the two whistles. The locomotive was moved away from two observers who were stationed at a given point. Stops were made at equal intervals of distance, the front end whistle being sounded first and the rear whistle being sounded second at each stop. This test showed that within a distance of one mile the sound intensity from the front end whistle was much more effective than from the rear whistle. As the distance was increased beyond one mile

for by the fact that each whistle was screened by an obstruction, namely, the front end whistle by the deflector stack, dome, turrets and cab, and the back end whistle by the cab.

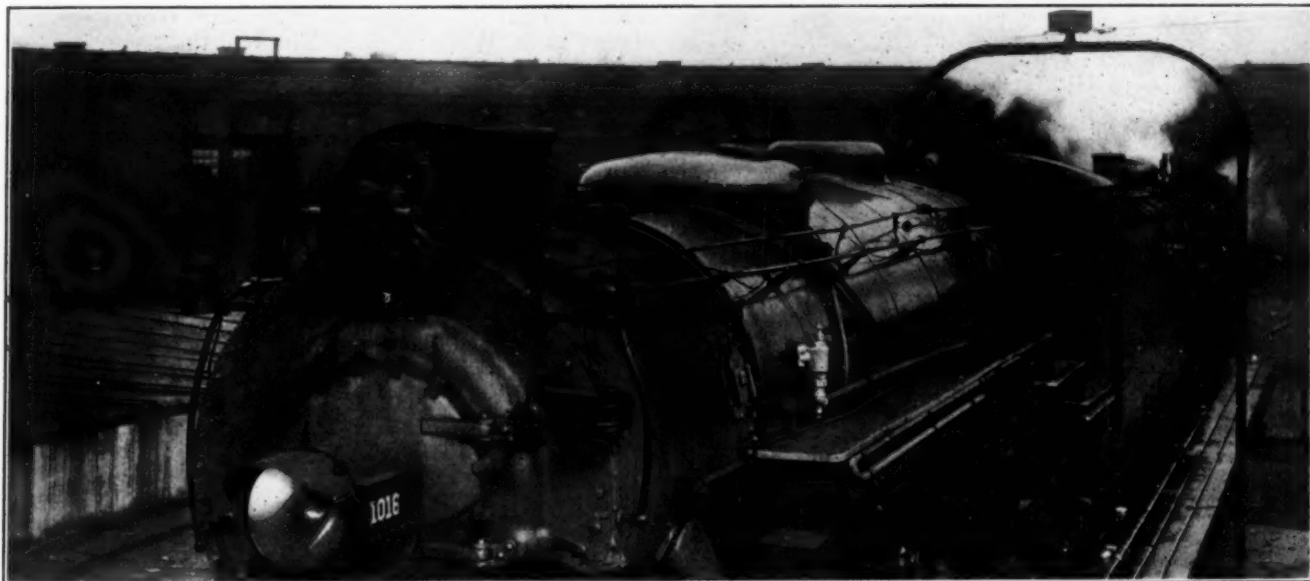
The Treatment and Service of Creosoted Pine Poles*

By E. E. Boehne

Manager of Sales, International Creosoting & Construction Co., Galveston, Tex.

ACCORDING to government statistics the use of creosoted pine poles increased 500 per cent between 1920 and 1925, 500,000 of these poles being installed in 1923, as compared to 1,000,000 in 1924. This fact is particularly outstanding because this is the only species of pole, the use of which increased materially during that period.

The value of a pole is measured by the length of time it gives satisfactory life in the line. Decay shortens life in the great majority of cases and its prevention is of prime consideration. Decay in wood is caused by



Chicago & Eastern Illinois Pacific Type Locomotive Equipped with Front End Whistle

the relative sound of the two whistles approached an equality, until at a distance of three miles both whistles were of about the same intensity. The consensus of opinion of the observers was in favor of the front end whistle.

Similar observations were also made when the deflector or sounding board was removed from the front end whistle. Only a slight difference in the relative loudness of the whistles was noticeable. It was thus demonstrated that the deflector was largely responsible for the greater effectiveness of the front end whistle, from the standpoint of a warning, as the locomotive moved towards a given point.

An investigation was also made concerning the efficiency of the front end whistle in calling in the flagman. The locomotive was moved forward away from the observers and the same tests repeated as described in the preceding paragraphs. These tests showed that there was no noticeable difference as to the relative intensity of sound between the two whistles. This was accounted

low forms of plants called fungi; and by bacteria. Through the secretion of chemicals, which are but little understood, the wood fibre is dissolved and its substance serves as food for the fungus. The science of timber preservation consists in poisoning that food (the wood) and creosote is the poison. The operation of injecting it deeply into the wood by pressure is the work of the modern wood preserving plant. Other wood preservatives may be used, but creosote is the best. The highest grade, and the only grade that should be used, complies with the specifications of the American Wood Preservers' Association and the American Railway Engineering Association.

The first step in the creosoting of pine poles, or rather a step preliminary to their treatment, is to "season" them, that is, to remove a sufficient amount of the moisture which all freshly cut wood contains to permit the entrance of the creosote. This is accomplished either

* Abstracted from a paper presented before the Missouri Association of Public Utilities, Cape Girardeau, Mo., on May 6.

by allowing the wood to dry in a seasoning yard, or by steaming it in the treating cylinders.

Two processes have recognized standing and are in general use for pole treatment: one the Bethel process, using 12 lb. of creosote per cubic foot of wood, and leaving the wood-cells full of creosote after treatment; and the other the Rueping process retaining 8 lb. of creosote per cubic foot and leaving the wood-cells partially empty after treatment.

Strength of Pine Preserved by Treatment

Pine, of all the commercial species, is the most susceptible to preservative treatment. Deep penetration



Poles Should Be Seasoned and Framed Prior to Treatment

is an all-important factor for it is a practically direct measure of the value of treatment—this because any kind of wood will check and once the checks extend in beyond the creosoted layer, untreated wood is exposed to decay and insect attack. Deep creosote penetration, therefore, is a first essential to good pole treatment.

The strength of pine is the highest, the most permanent and the most uniform of any of the pole woods. Exhaustive government tests show its modulus of rupture to be over 30 per cent greater than the next highest pole species. Of equal importance is the fact that 15 or 20 years after installation, that strength is no less than when the poles first went into the line. Recently the American Telephone & Telegraph Company tested sound creosoted pine poles 27 years old and found them practically as strong as new.

After studying the plotted results of the load in pounds at which hundreds of test poles broke, the Bureau of Standards pointed out that the strength of individual poles in the Southern Yellow pine group departed less from the average than any of the other species. In line construction practical advantage is taken of the above facts in one of two ways—either by using smaller poles or by using longer spans.

The life of creosoted pine poles is not known. The oldest installations are still in use; their present condition is good and there is nothing to indicate how much longer they will last. Several lines, cited below, for which records are available, show less than 10 per cent renewals in 25 to 30 years. In many lines 10 to 20 years old it has not been necessary to replace a pole. The remarkable thing is that these very old poles are still apparently in splendid condition. An increment boring taken at the ground line on a 25-year-old pole

is of such appearance that if placed in a group of borings from creosoted poles just treated it could not be distinguished.

Various published estimates of the life to expect from creosoted pine poles include: Pennsylvania Electric Association—35 years, Graybar Electric Company (full cell treatment)—40 years and from "Notes on Wood Preservation and Utilization in Europe," by George M. Hunt, Forest Products Laboratory: "The life of full-cell treated pine poles in England was understood to be from 30 to 40 years. There are said to be 40,000 creosoted power line poles in Southern France which are over 20 years old and have not yet reached their average life."

The attack of white ants on poles is becoming an increasing vexing problem. Once they gain entrance to a pole, nothing can stop them. An investigator for Stone & Webster has just published his discovery of white ant attacks in disturbing numbers in the New England states. The Western Union Telegraph Company, conducting studies on its own lines only a year ago, learned to its surprise that white ant attack on poles was occurring in the states of New York, Pennsylvania and Illinois. The status of creosoted pine poles, with regard to white ant attack, is covered by the statement quoted below from government bulletin No. 1231 "Tests of Methods of Protecting Woods Against Termites or White Ants." The bulletin says:

"The most effective preservative in protecting timber to be set in the ground from attacks by termites is coal-tar creosote . . . Impregnation by the full cell process with coal-tar creosote renders wood resistant for at least 25 years."

Excess of Creosote on Surface

In times past and occasionally even now the question is raised as to the use of creosoted pine poles on city streets or around station platforms or grounds. Some objection has been raised to their use on the basis that their oily surface will damage the clothing of people who might come in contact with them. With the advent of the Rueping empty cell process, this objection has been largely eliminated. The science of wood preservation has advanced greatly during recent years and with the better knowledge of timber seasoning methods, of creosote, and of treatment, the creosoted pine pole, particularly when treated by the Rueping process, has little objection on this score. Comparatively speaking, it is a clean pole. Creosoted pine poles do differ in quality, although they all look black on the surface, yet the service in the line depends on what is beneath the surface—the soundness of the timber, the quantity and quality of the creosote, and the thoroughness of the treatment.



Photo Courtesy J. D. Rogers

A Section Gang on the Uganda Railways

Pullman Supply Methods Simplify and Expedite*

"Common sense" ways in use also facilitate standardizing and more economical purchasing

Part II

THE plan under which the Pullman supply operations are now conducted has been referred to as the "common sense method." This is because of its freedom from "red tape" and the extent to which simplicity and directness have been injected into the work. Four devices invite consideration in this connection—bin tags, a special type of master stock book, a single item requisition, and a catalog.

Use Bin Tags to Record Stock

The Pullman Company is distinctly an advocate of the bin tag method of keeping stock. The tag is a card-board 3 in. wide and 8 in. long resembling the Pullman diagram used in recording sleeper reservations. There is a card for every item of stock carried in any store-room and each card is provided, both front and back, with spaces for keeping a continuous record of every transaction in which the particular item of stock is involved. There is a space for the record of all material received by purchase and by transfer, and of material recovered from cars, likewise spaces for the record of each issue and transfer, as the case may be, as well as a summary of the quantity of the material on hand at the first and last of the month.

The procedure is to note the transaction on the card when it occurs and there is no mistaking how to record it because the printing on the card is self-explanatory. When the end of the month comes, the tag is taken from



Packing Supplies for Shipment in Knock-Down Cases

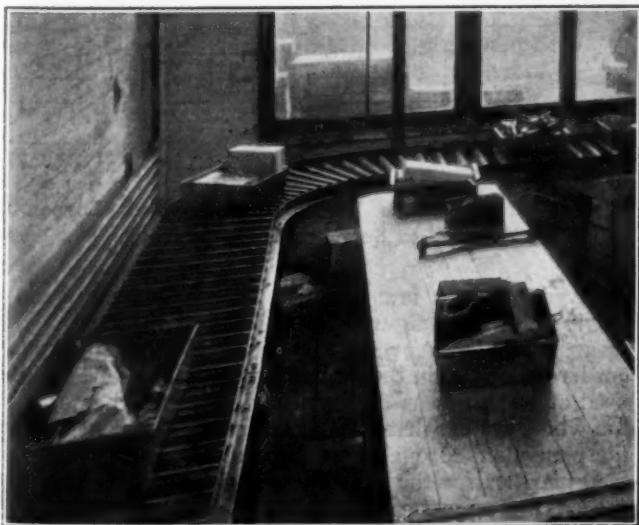
the bin, if the stock in the bin has moved, and mailed to the general office which transcribes the record of stock received, issued and carried in a master stock book, and then forwards the tag to the accounting department where the charges for all material issued are made to the proper accounts. If the condition of stock has not changed, the tag stays where it is, thus dispensing with much unnecessary detail, the general store in this case simply carrying the previous month's stock book record forward.

It will be seen that in the Pullman operation the bin tags are not a supplementary practice but basic. This is emphasized because in addition to bin tags each district store keeps a stock record book. These books consist of a loose-leaf binder with each sheet restricted to one item and containing only as many sheets as there are items carried. But this book does not assume the functions of the bin tag. It is more in the nature of an office ledger providing a permanent record over the period of the year of the stock issued, received and carried as recorded from the live bin tags before they are mailed to headquarters. It is the bin tag that gives the supply officer a current history of his stock and they likewise serve as the basis of replenishment system control and accounting. The only thing essential to the day by day government of the store not covered by the bin tags are allotment figures which have been developed for each item at each store specifying the minimum quantity of any item that should be carried at the store and also the maximum quantity, but these are marked on the description tag which is permanently fixed to the bin.

The bin tag practice is an old institution in this company's supply work which was found so well adapted to the conditions through the flexibility it allows in the arrangement of the stock, etc., that the aim of the efficiency studies of 1923† was to increase rather than decrease their utility, which was done by routing them through the general store office before they reach the auditing department.

Money Versus Unit Control

The master stockbook and catalog of the Pullman supply department are distinctive in their forms and functions. Both are products of the investigation in 1923. It is significant that the many shortcomings which led to this investigation were found to rise in the



In the Shipping Room of the Main Store on a Slack Day Showing Portion of Conveyor System and Trays

*The continuation of an article begun in the issue of July 23.
†Referred to in Part I, issue of July 23.

main from a deficient knowledge of the material carried. It had become the habit to depend too much upon the book value of supplies purchased and carried to control stock and not enough upon the consideration of what that material consisted. The book value of stock carried was regularly determined for various stores, but they were frequently misleading. For example, imposing quantities of materials shown on the books at full value were found to be of practically no value by reason



Another View of Shipping Room with Trays of Outgoing Materials Ready for Packing. Description Stencils Overhead

of obsolescence. In some cases this resulted from a car modernizing program of which the storekeeper had no knowledge. In other cases, certain equipment had been transferred from one district to another district without the storekeeper of the first district knowing what material was already available at the first store, etc. Considerable confusion also resulted from a lack of uniform descriptions, while an increasing amount of material was being carried which was susceptible of elimination through standardization.

Catalog of Stores Developed

The latter condition led to the development of a catalog which was three years in the making, but which is believed to be without parallel in railway supply work. This catalog lists 12,500 items of the 19,000 used in Pullman equipment and is distinguished by the fact that it contains pictures of the items as well as their descriptions. A loose leaf binder is used for the purpose so that the catalog can be kept up to date simply by discarding the leaves subject to revision and inserting new ones, the practice in this case being to require the return of the old sheets to preclude any failure to make the revision. Material is all arranged by classes, such as electrical material, truck material, car heating material, etc., and the items in each class are listed alphabetically in printed tabulations which give the number of items called for in each car or unit of equipment, the order number, and a reference to the plates in the catalog where the item is illustrated in relation to other parts of the same equipment. Typical catalog pages and illustration plates are shown.

The value of this catalog is such that a copy is placed in the hands of all supervisory officers as well as storekeepers not only in the operating organizations, but in

the manufacturing works as well, and several people of several departments devote their entire time in keeping it up to date. With it there is little occasion for a storekeeper to carry material no longer in use at a particular point or to commit the multitude of errors in ordering one kind of material or equipment when another kind will serve the purpose that were a daily occurrence before.

Consumption of Any Item Quickly Found

A feature of the master stockbook lies in the fact that one page is used for one item of material. This is principally because there are 115 stores, including the repair shop, to consider in the master stockbook, but it has decided advantages other than that of furnishing at a glance the monthly record over a year of the stock on hand, stock issued and stock received at each of the many points separately and in relation to each other. In the first place the foregoing records for each store are not recorded under each other, as is the usual case, but in separate columns so that, quite in contrast with conditions prior to 1923, it is now possible to determine the total quantity of any item of material used, or issued or

REQUISITION FOR MATERIAL		N ^o 301 -4	
Please furnish the following material and ship to:			
<input type="radio"/>	THE PULLMAN COMPANY, STOREKEEPER Terminal Yard, Jacksonville, Fla.	A. F. E. No. To: STOREKEEPER STORE No. 1	
<input type="radio"/>	Delivery Required July 30, 1927	Date July 13, 1927	
APPROVED: _____		APPROVED: <i>W. W. Adair</i>	
(The description shown hereunder should conform strictly to that in the catalog. Give transfer should be similarly worded.)			
<input type="radio"/>	QUANTITY	DESCRIPTION	CATALOG NO
<input type="radio"/>	2 ea.	Pulleys, Armature	8" E-274
<input type="radio"/>			
<input type="radio"/>			
<input type="radio"/>			
<input type="radio"/>			
Shipped: _____		APPROVED: <i>M. B. Shum</i>	
Via: _____		CHICAGO, JUL 15 1927	
<input type="radio"/>	Package No. _____	GENERAL STOREKEEPER	
ACKNOWLEDGMENT OF ORDER OR SHIPPING NOTICE		N ^o 301 -4	
Please furnish the following material and ship to:			
<input type="radio"/>	STOREKEEPER, THE PULLMAN COMPANY Terminal Yard, Jacksonville, Fla.	STOREKEEPER STORE No. 1	
Shipped, as ordered, has been made on requisition, above number:		Requisition, above number, has been placed:	
Shipped: July 16th, 1927		Order No. JUL 15 1927	
Via: <u>By Freight</u>			
Package No. 3			
FORM 32-17-1-1. PRINTED BY PULLMAN CO. & MFG. CO., CHICAGO, ILL.			
		BLUE COPY—FOR CONSIGNOR	
		BLUE COPY—MANIFEST	

A Copy of the Single Item Requisition with Coupon at Bottom to Serve as Shipping Notice

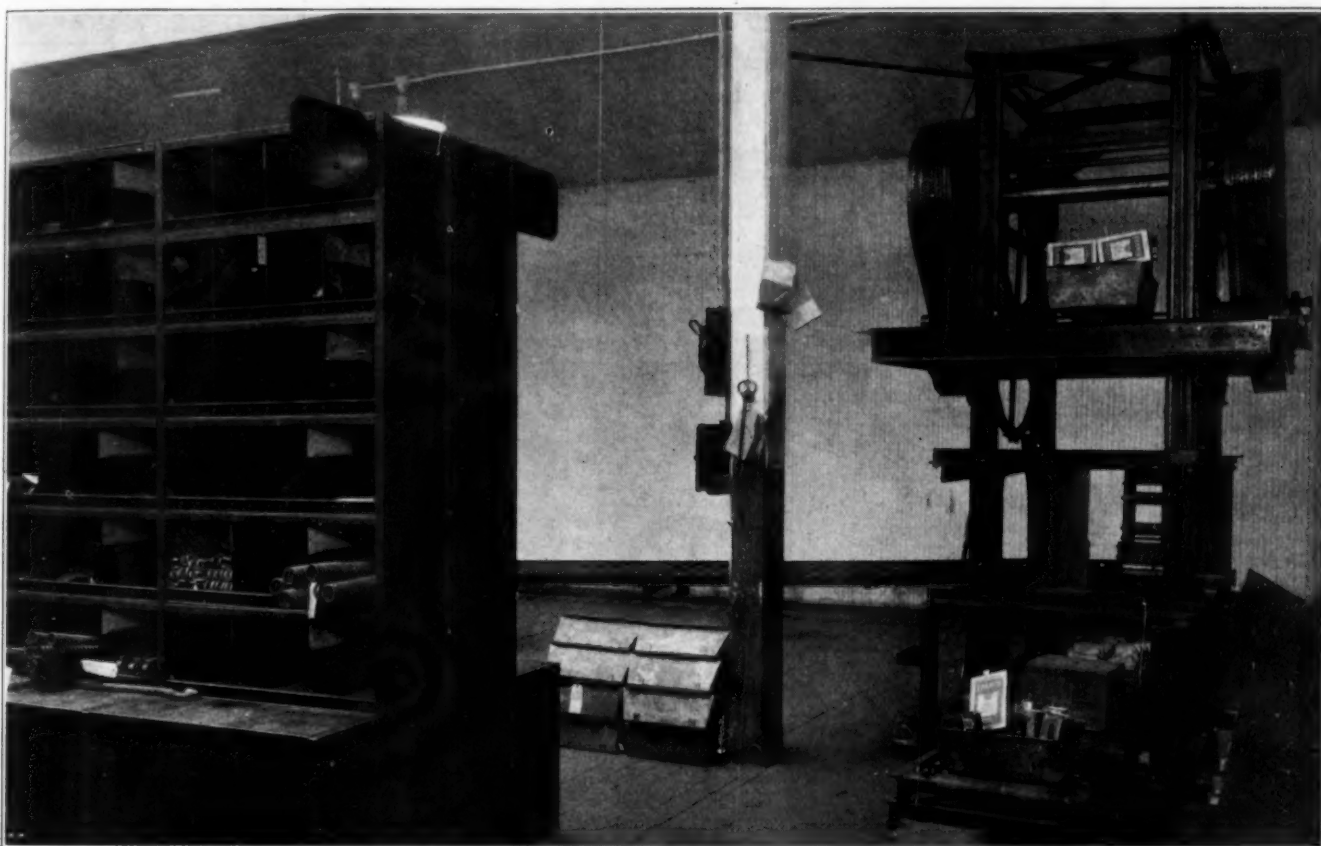
received within a few minutes, simply by totaling up a single column of figures on an adding machine. This arrangement, moreover, is so useful in detecting apparent irregularities in the amount of stock of a certain kind used at one point as distinguished from another or over the whole system that the mechanical department devotes the equivalent to one man's time to the studies of these irregularities for the assistance they afford in improving the quality of material used, etc. A printed form with a blank space at the top for designating the items and spaces opposite the names of each storeroom, already printed, expedites this work in all cases.

Purchase in Bulk Lots

But of greater importance than this is the value of this arrangement to the purchasing agent in buying material in the most economical quantities without shouldering the store department with surpluses. The single sheet quickly shows how much is consumed, while a consideration of the status of the particular equipment, the market conditions and freight rates determine how much may wisely be purchased at once. From these data the purchasing agent can contract for the required amount under an arrangement whereby deliveries will be made in sizeable quantities as called for by the store department. The store department is enabled to do this by the record provided at the bottom of the master stock sheet for any item, where the quantity contracted for and the date of the order is first recorded, followed by a progressive record of the quantities received in each delivery under that contract, whether the material is all shipped to the main store, as is the usual case, or direct to other stores as indicated by this master record. The master stock

The outstanding feature of the Pullman requisition is that one requisition is concerned with one item of material and no more. It doesn't make any difference if the collection of items of material all fall into the same class nor even if the problem is to order several different sizes of the same material. Each must be ordered on separate requisitions. This may seem cumbersome by reason of the greater number of requisitions to be made and amount of repetition work involved in writing addresses, etc., but the effect is just the reverse. In the first place, the serial number, shipping directions and all other information possible, are printed on all forms to save the storekeeper this work. It is also possible to abbreviate the description by employing a catalog number so that it is practicable in the Pullman organization not only to allow but to require storekeepers to write out their orders in the same way a bill of lading is filled, and thus dispense with stenographers which would otherwise be necessary at many storerooms.

But the principal benefits accrue from the time the



Upstairs in the Main Store Showing the Bin Tags in all Bins and Elevator of Conveyor System Set to Lower Material to Shipping Room

book thus serves as a most effective agency in the economical purchase of material as well as in its control and proper distribution.

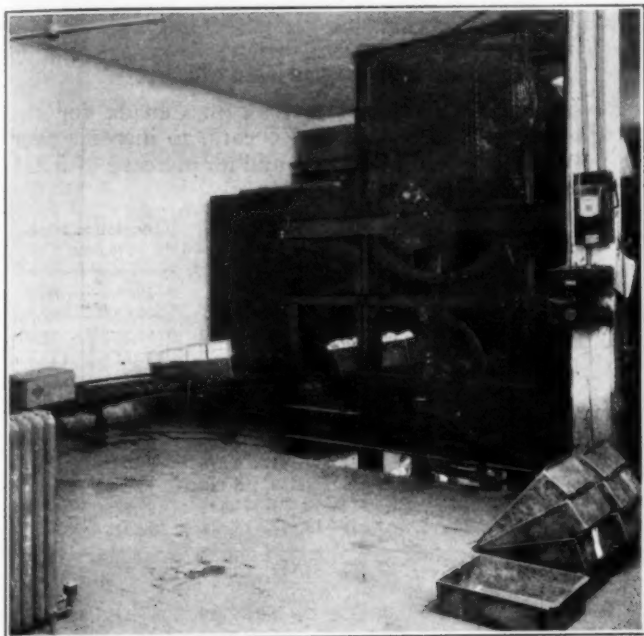
Quick Action with Single Requisition

One of the greater sources of confusion, delay and expense in operating a supply department is the procedure of replenishing stock. It is bad enough on a railway whose storehouses are many, but a matter of real consequence when they are legion, if the desire is at all to keep the stock and payroll down. There isn't anything in the whole Pullman system that illustrates this company's insistence upon simplicity and dispatch in its operations so well as the procedure it has adopted in this respect.

requisition leaves the storekeeper until the material is received. A requisition consists of an original sheet and three carbon copies all of different colors. The storekeeper keeps the white copy and sends the buff copy, the blue copy and the pink copy to the general office. In every case he indicates the date when the materials should be received. With each requisition confined to one item of material it is possible for all requisitions reaching the general office to be sorted out according to the catalog numbers of each item of material called for. The first step is to check each requisition against the master stock book record to determine first, whether there is any discrepancy between records of stock on hand, etc., reported on the pink copy of the storekeeper's requisition and the record in the stock book as deter-

this use, following which the blue copies of all the requisitions go into the top of the case. After nailing on the cover, the box is bound by turning down the ends of three wire bands that encircle the sides and twisting them by means of a special tool. The next step is to address the cases which is done with a stencil, and the crate is ready for delivery.

This is a simple matter. Unlike most general stores, the main store of the Pullman Company is not served by railroad tracks, but it is located in the heart of the freighthouse district of Chicago. Delivery is made di-



A Side View of the Elevator Discharging Trays on Receiving Conveyor

rectly to these freighthouses by motor truck where the cases can often be loaded immediately into a car going directly to the point of destination.

Little labor is required in these operations, and there is no breakage or loss of shipments attendant upon slipshod methods of handling, but the effectiveness of the entire arrangement of ordering and shipping is best illustrated by the fact that freight shipments from Chicago are frequently received in storerooms along the Atlantic seaboard within eight days after requisitions have been made out and mailed to the general office. It is unusual to have Pullman equipment delayed because of a supply shortage.

UNIVERSAL CONSOLIDATED CARS.—This is the keynote of a circular which has been issued by the Universal Carloading & Distributing Company, 40 Rector street, New York, which says that its business of gathering shipments from different consignors and consolidating them into car loads, thus securing the advantage of lower freight rates, has in 15 years developed into a nation-wide organization, now serving over 125,000 shippers and receivers. The average number of cars loaded monthly is now 5,000 containing over 90,000 tons of merchandise. The circular gives the names of 40 cities to which cars are sent from New York, and of 17 from which cars are received daily in New York. Another list gives the names of 42 cities at which the company maintains offices. In the month of May, the number of claims received was only one to each 175 shipments. The company has three receiving stations in Manhattan, two in Brooklyn, one in Jersey City and one in Long Island City. It solicits only such articles as are carried by the railroads in carloads at third class or less; and for Pacific coast points only a limited number of commodities will be accepted.

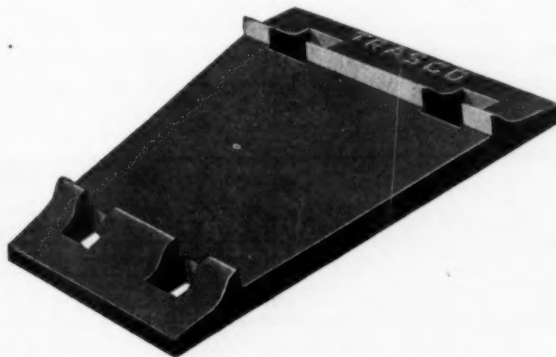
An Eccentric Tie Plate Without a Long Heel

AN ingenious and inexpensive means of providing the necessary eccentricity of a tie plate to equalize its bearing on the tie has been developed in a new plate that has been brought out by the Track Specialties Company, New York. Maintenance of way officers and manufacturers of tie plates have long recognized the necessity for designing a plate in such a manner that the center of gravity of the bearing area will lie outside the vertical plane through the web of the rail to coincide with the resultant of the vertical and lateral forces acting on the rail. This resultant is inclined in an outward direction and intersects the base of the rail outside the center line of the base as has been demonstrated by experience with the common tendency of rails to roll outward.

The solution of this problem in the design of a tie plate has been to proportion the plate in such manner that the center of gravity of the bearing area coincides with the point at which the resultant of the forces acting on the rail intersects the base of the plate. With a plate of rectangular outline as ordinarily used, this is accomplished by offsetting the plate with respect to the center line of the rail. In other words, it has a greater extension outside than inside the rail.

Center of Gravity

The new plate, which is known as the Trasco Trapezoidal tie plate is symmetrical in section about the center line of the plate, but is trapezoidal in plan, being wider along the edge outside the rail than on the edge along the gage side of the rail base. By this means, it is readily possible to locate the center of gravity of the plate-bearing area at a sufficient distance outside the center of the rail to coincide with the resultant of the forces acting on it, without extending it out as far as would otherwise be necessary. And inasmuch as the



Trasco Trapezoidal Tie Plate

thickness of a tie plate is contingent upon obtaining enough stiffness in the extension to prevent it from bending up, plates of this design do not need to be as thick. It is claimed that the resulting saving in metal may be as much as 25 per cent. For instance a Trasco Trapezoidal tie plate 9 in. long, 8 in. wide on the outside and 5 in. wide on the inside, with the center of the rail coinciding with the center of the tie plate, is said to set into the tie with the same uniformity as a rectangular tie plate 10 in. long with an eccentricity of $\frac{1}{2}$ in.

Rolled from Steel

Plates of this design will be rolled from steel to meet specifications of the railroads and can be had in any

non-patented type of base, although the present plan is to roll these plates with flat bottoms. The plates are punched for either three or four holes, as desired, but must have shoulders on each side as economy with beveled shearing demands that the plate be symmetrical in section.

Plates of this design which have been subjected to tests are said to have settled with absolute uniformity.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading for the week ended July 16 amounted to 1,016,782 cars, a decrease of 55,590 cars as compared with the corresponding week of last year and an increase of 3,928 cars as compared with 1925. The principal decrease was in

Revenue Freight Car Loading

Week Ended Saturday, July 16, 1927

Districts	1927	1926	1925
Eastern	231,646	241,423	238,837
Allegheny	206,188	218,485	206,905
Pocahontas	58,650	60,372	52,815
Southern	149,803	151,080	143,433
Northwestern	157,446	168,084	150,862
Central Western	140,263	159,278	143,381
Southwestern	72,786	77,650	76,621
Total West. Dist.	370,495	405,012	370,864
Total all roads	1,016,782	1,076,372	1,012,854
Commodities			
Grain and grain products.....	42,523	55,719	43,903
Live stock	27,466	27,255	26,990
Coal	152,154	183,195	171,851
Coke	9,663	11,218	9,294
Forest products	66,969	69,579	68,177
Ore	66,419	75,850	62,668
Mdse. L. C. L.	255,663	255,901	253,945
Miscellaneous	395,925	397,655	376,026
July 16	1,016,782	1,076,372	1,012,854
July 9	839,308	897,556	986,893
July 2	1,021,262	1,065,641	866,199
June 25	1,018,206	1,055,362	993,173
June 18	1,016,351	1,036,643	984,583
Cumulative total, 29 weeks..	28,204,078	28,048,720	27,194,436

coal loading, which was 31,041 cars less than that for the corresponding week of last year, but there was also

a decrease of 13,196 cars in loading of grain and grain products, and livestock was the only commodity classification to show any increase. All districts also showed decreases as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, is shown in the first column.

Car Surplus

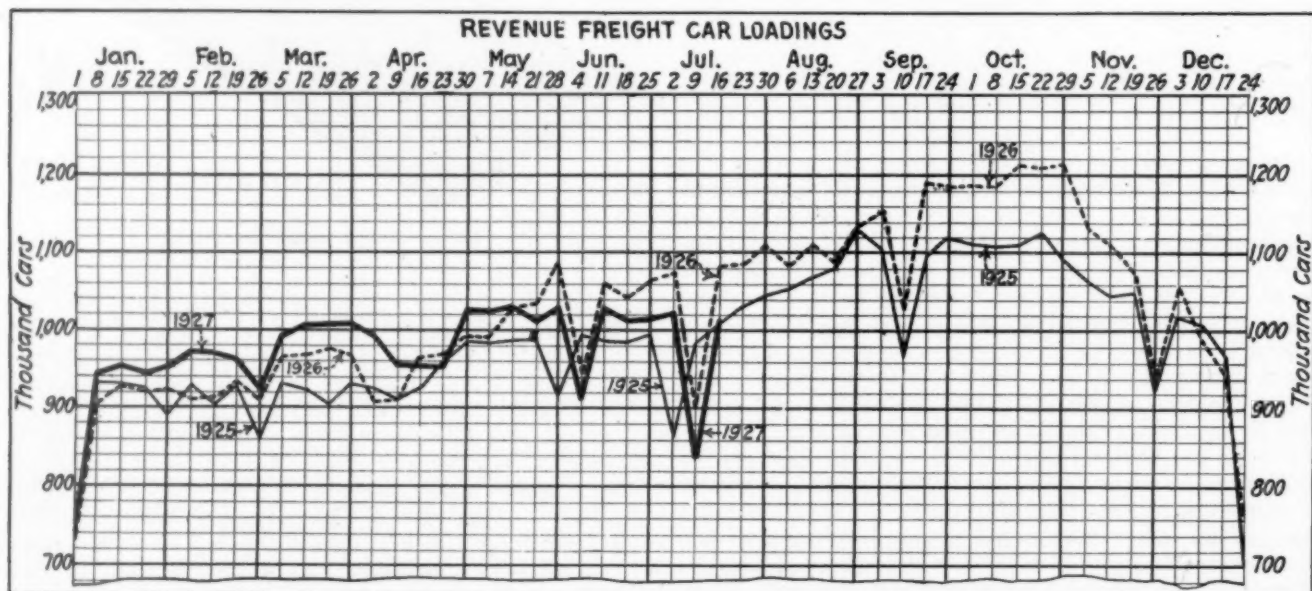
The freight car surplus for the week ended July 7 averaged 282,559 cars, an increase of 8,336 cars as compared with the preceding week. This included 148,598 box cars, 88,113 coal cars, 21,877 stock cars and 15,941 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended July 16 totaled 63,469 cars, an increase over the previous week of 1,920 cars and an increase of 3,211 cars over the same week last year.

Commodities	Total for Canada			Cumulative totals to date	
	July 16, 1927	July 9, 1927	July 17, 1926	1927	1926
Grain and grain products..	6,104	5,836	5,107	200,608	192,397
Live stock	1,795	1,749	1,832	53,899	55,401
Coal	6,850	6,704	5,437	177,674	137,344
Coke	296	256	210	8,873	10,890
Lumber	4,404	4,188	4,296	102,115	100,557
Pulpwood	2,132	2,193	2,486	104,950	84,196
Pulp and paper.....	2,224	2,075	2,306	62,525	70,313
Other forest products.....	2,651	2,101	2,618	88,003	92,282
Ore	2,129	1,533	2,184	43,394	44,195
Merchandise, l. c. l.....	17,253	18,121	17,135	469,936	445,067
Miscellaneous	17,631	16,794	16,647	382,338	372,037
Total cars loaded.....	63,469	61,549	60,258	1,694,315	1,604,729
Total cars received from connections	35,035	32,441	36,489	1,069,519	1,041,836

IN AUSTRIA it is proposed to extend the program of railway electrification initiated in 1920 and scheduled for completion in its present form by the end of 1928, says a report from Vice Consul C. Warwick Perkins, Vienna. A plan worked out by a well-known expert recommends the addition of lines between Vienna and Salzburg, Vienna and Graz, and the Tauern Railway (Schwarzach-St. Veit to Millstatt). The total length of these lines amounts to 376 miles. This group includes two important main lines, Vienna to Salzburg and Vienna to Graz.



A New Treating Plant for Locomotive Water Supplies

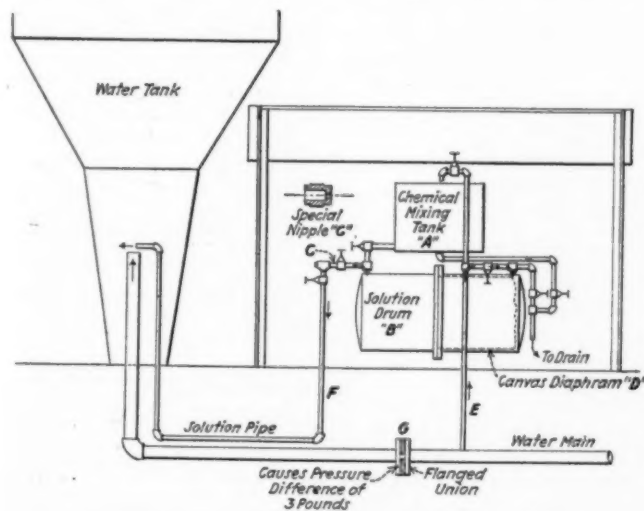
A TREATING plant for locomotive water supplies is now being built by the Dearborn Chemical Company, 310 South Michigan avenue, Chicago, for automatically feeding Dearborn water treating preparations into water supplies where it is desired to do this rather than to introduce them directly into the tenders of locomotives. The features of the plant are its simplicity and compactness and its ability to proportion the flow of solution to the flow of water and to operate only at such a time when there is an actual flow of untreated water.

It consists of a chemical mixing tank A with a chemical mixing basket, and a solution drum B with a diaphragm bag. The chemicals are dissolved in the mixing tank A. To charge the plant, the solution in tank A is let flow by gravity to the solution drum B. This drum is in two halves. Held between the flanges of these halves is a canvas diaphragm.

Action on Diaphragm

The solution entering the solution end of the drum forces the diaphragm across to the opposite end until the drum is full of solution. At the same time, water that has accumulated in the water end of the drum is forced out of the drum and into the outside drain or sewer in the charging process. The water main leading to the storage tank has inserted in it a flanged union, between the two sides of which is a metal plate G. This plate has a hole in it of such size as to cause a back pressure of about 3 lb. per sq. in. in the average flow of water. From the higher pressure side of this plate G a 1½-in. pipe E leads to the water end of the solution drum. A 2-in. pipe leading out from the solution end of the drum, conveys the chemical to the storage tank where it mixes with the incoming water.

The reason why any solution should flow to the large

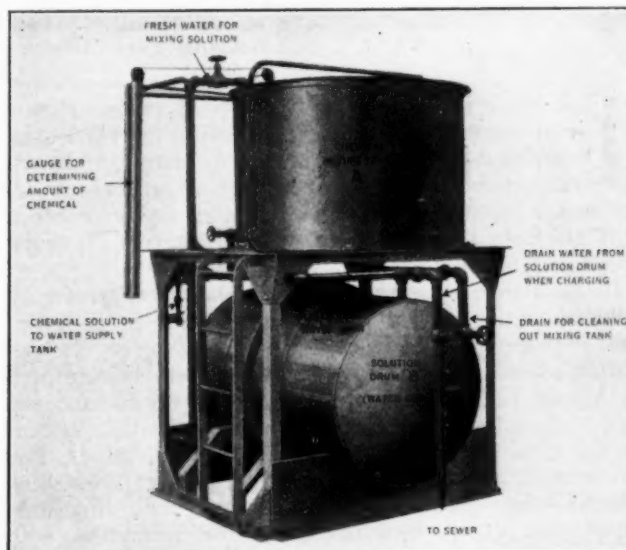


General Arrangement of the Dearborn Plant

supply tank is not apparent from an inspection of the plant. When water flows through plate G, a back pressure is caused, by virtue of which part of the water is by-passed through pipe E to the water end of the drum. The diaphragm is gradually pushed towards the opposite end of the drum, forcing the solution out through pipe F and up into the water tank. The rate of flow of the

solution is controlled by means of a constriction in the treatment line at the special nipple C. This nipple is closed at one end, except for a hole 3/32 in. in diameter. At 3 lb. back pressure the flow through this hole would be about 20 gal. per hour. The relative amounts of solution and water flowing depend on the relative areas of the two constrictions at C and at G.

A 2-in. hole at G would mean that the amount of water flowing would be 450 times as great as the flow of solution through a 3/32-in. hole at C, the areas of the two holes being as 450 to 1. When the water stops



The Dearborn Treating Plant for Locomotive Water Supplies

flowing the excess pressure, of course, disappears and consequently the flow of the solution stops. Moreover, any flow of water, however variable, causes a back pressure that always results in a flow of solution proportionate to the flow of water.

Solution for 24 Hours

The drum is designed to hold enough solution to last at least 24 hours at the average water station. The only attention the plant needs is to mix up the specified quantity of Dearborn treatment once a day and charge the drum, an operation requiring about 20 minutes. At heavy watering stations it may be necessary to charge the plant two or possibly three times in 24 hours.

The plant is manufactured in two sizes. The larger unit occupies a floor space about 6 ft. by 7 ft. and is 8 ft. high. A building 12 ft. by 16 ft. by 12 ft. 6 in. high inside, located close to the supply tank, should be provided to house the apparatus and provide storage room for a supply of water treatment. The dimensions of the small unit are 4 ft. 3 in. by 5 ft. 7½ in. in height and it requires a floor space about 5 ft. square.

The chemical mixing tank A is composed of No. 10 gage tank steel. The seams are electrically arc welded. All tappings are reinforced with forged steel bosses welded to the tank. The solution drum is composed of 3/16-in. tank steel with 5/16-in. heads, and is built in two parts. Rivet-weld construction is used throughout, the seams being both hot riveted and electrically arc-welded.

The diaphragm bag is made of heavy duck, water-proofed and reinforced. The solution drum is designed for a working pressure of 80 lb. per sq. in. and is tested at 150 lb. per sq. in.

Close Supervision Cuts Yard Expense

Rock Island inaugurates comprehensive system of operating reports which effect large savings

By H. R. Fertig,

Chief of Yard and Terminal Operation, Chicago, Rock Island & Pacific

THERE is probably no branch of transportation in which there are greater possibilities for losses, neither has any other branch as many component parts subject to the immediate control of supervising officers, nor is there a branch presenting so favorable a field for intensified supervision and control, as yard operation.

In an article appearing in the February 19 issue of the *Railway Age*, mention was made of the reduction in yard expenses by the Rock Island Lines under the operation of the revised classification system inaugurated on March 1, 1924. While that article emphasized the general beneficial influence of the classification system on the handling of traffic and on yard operations, this article will further emphasize this influence and show some of the results of the systematic and intensified supervision given yard operations in connection with such classification.

When it is considered that the wages paid yard enginemen and trainmen represent 40 per cent of the total wages paid employees in road and yard freight service, and that the total transportation yard expense is one-tenth of the total operating expense of a carrier, one questions why, in general, the 60 per cent gets so much more of the supervision than the 40 per cent and what the possibilities are for reductions in the yard wage item of \$4,700,000 per year compared with the \$7,600,000 for road enginemen and trainmen wages.

These questions were answered by the Rock Island through the inauguration of a special organization on March 1, 1924, for the purpose of supervising all phases of yard operation, especially the classification of freight trains, the operation of yard engines, and other features of operation in which improvements or restrictions can be obtained. This plan did not in any manner restrict the supervision of district or division officers, but rather supported such supervision, enabling such officers to have a prompt and efficient record of the performance of trains through terminals and of the operation of yard engines at each of the yards where yard engines are used.

Through this system of supervision, each yardmaster and each district and division officer knows the functioning of each yard on his territory daily and immediate action can be taken to correct any conditions which are leading to excessive increases in yard operating expenses instead of, as under most plans, waiting until the latter part of the succeeding month, or later, before knowing what the expense has been.

Large Reduction in Yard Wages

This plan of supervision met with the hearty co-operation of each yardmaster. The yardmaster and his assistants are more directly responsible for expensive operating costs than any other direct supervisor of transportation expenses, and their training makes them

alert to the possibilities of reducing those expenses for which they are responsible. This has been clearly demonstrated on the Rock Island Lines during the three years from March 1, 1924, to February 28, 1927. During the year from March 1, 1924, to February 28, 1925, there was a reduction of 316,507 yard engine miles as compared with the same period of 1923-24; this reduction resulted in a total saving in enginemen-trainmen wages of \$351,956. This was followed by a reduction of 339,413 yard engine miles, exclusive of the increased

ROCK ISLAND LINES

FREIGHT TERMINAL PERFORMANCE FROM Valley Junction, Iowa Yard
24 Hours Ending 11:59 P.M. April 20, 1927 and TOTAL TO DATE THIS MONTH

Actual Time Worked by Yard Engines and Wages	ENGINE HOURS	WAGES TODAY	TOTAL TO DATE		NUMBER ENGINES
			HOURS	WAGES	
Total Yard Engine Hours (Straight Time)	160'	\$18 00	3168'	12 \$30 30	Assigned 15
Total Yard Engine Hours (Overtime)	5'25	31 90	109'15	644 65	Available 13
TOTAL YARD ENGINE HOURS (Straight and Overtime)	165'25	649 90	3277'15	12 875 15	Used Today 13
Departmental Switching (Straight Time Rates)	5'	19 25	140'	539 80	Jobs Today 20
TRANSPORTATION HOURS (Freight - Passenger)	160'25	630 65	3137'15	12 555 65	FUEL CONSUMED
Switch Tenders; Pilots Yard Masters		33 20		664 00	Today 100
Regular and Relief Clerical Forces		62 55		1 249 40	To Date 1930
(Charged to Yards)		102 40		2 055 25	RESTOCKED TODAY
TOTAL TRANSPORTATION HOURS AND WAGES	160'25	828 80	3137'15	16 284 30	System 7
					Foreign 2
					TO DATE
					System 33
					Foreign 29
					TOTAL CARS 62

FREIGHT AND PASSENGER CARS HANDLED		DEPARTMENTAL AND PASSENGER		
HANDLED TODAY	CARS	ACTUAL TIME CONSUMED	TODAY HOURS	HOURS TO DATE
Inbound Freight	18	647	5'	118'10
Outbound Freight	19	633	0	10'20
Inbound Passenger	16	55	0	11'30
Outbound Passenger	15	50	0	0
From Connections	133			
To Connections	126			
Short Loads Out	163			
Short Loads In	86			
TOTAL CARS HANDLED TODAY	1,893			
TOTAL CARS HANDLED TO DATE	36,508			
		UNIT COST	TODAY	TO DATE
		Cars per Trans-		
		portation Hour	11.8	11.6
		Transportation		
		Wages Per Car	43.7 ¢	44.6 ¢
		Passenger		
		Switching Hours	28	587

* Explain Overtime and conditions interfering with efficient yard operation

Correct (Signed) Harry Stone.
Agent of Yard Master

Fig. 1.—Daily Report of Freight Terminal Performance

industrial mileage at other than train yards during the 1915-26 period, with a saving of \$365,887. During the 1926-27 period there was a further reduction of 279,535 miles at other than industrial centers, representing a saving of \$301,016 in wages paid yard enginemen-trainmen.

These reductions in yard engine miles during the three

years represented a saving in wages alone of \$306,288 per year at train yards, exclusive of industrial yard increases not connected with train operation. During the 1925-26 and 1926-27 periods the excessive industrial development brought about a natural increase in work in these industrial centers, while the development in the Texas and Oklahoma oil fields brought about increases entirely foreign to train yard operation. Regardless of the industrial development, and including all increases in the oil fields, the net reduction in yard wages through the reduction in yard engine miles was \$152,501 per year.

Complete Reports Rendered

The foundation of all economic activities must be prompt and adequate in formation covering the items of expense to be controlled. This thought was crystallized in the daily report of freight terminal performance, giving the yard operation for the day and the cumulative figures from the first of the month to and including the date of the report. This report is reproduced as Fig. 1. Through the use of this form the yardmaster knows each day his cost per car with a comparison for the month to date, and by reference to previous reports he can make the same comparison for any previous day, month or year. Under the budget system used on the Rock Island lines, the division officer has a daily check against the budget allowance for each yard on the division, and can take action immediately to keep the expense at the budget figure.

On receipt in this office of the freight terminal performance report which is compiled at each yard where yard engines are worked and after it has been checked for errors, the information is tabulated and at the close of each month a consolidated report is made, covering each yard and division and the system. Form CT-53 used for tabulating the daily C. T. 52-A report (freight terminal performance) is shown as Fig. 2.

A Y.T.O.-1 (Yard-Terminal Operation) report is rendered monthly and is compiled and in the hands of all concerned by the eighth and tenth days of the month succeeding the one covered by the report. This record covers each yard, with totals for each division and district and for the system, and places in the hands of all officers interested in any angle of yard operation, definite

It would be impossible to issue such a mass of tabulations without having the information up to date as it is received, and this is made possible by bringing forward weekly the totals for each yard so that at the close of the month there are only one week's totals to compute, rather than a month's figures from each yard. Unless such action was taken and the information issued promptly,

PRODUCTIVE HOURS PER ENGINE PER DAY NOVEMBER 1926 ROCK ISLAND LINES							
YARDS	ENGINES		NUMBER JOBS WORKED	NUMBER ENGINES DOUBLED	PERCENT OF "USED"	PRODUCTIVE SERVICE	
	NUMBER AVAILABLE	NUMBER USED				HOURS	MILES
Chicago Terminal	1,434	1,131	1,704	583	52.0%	13'25"	80.46
Sioux	420	390	667	277	71.0%	13'55"	83.80
Kansas City	690	690	963	273	40.0%	11'30"	69.00
Fort Worth	293	291	550	259	89.0%	15'10"	91.02
Peoria	311	311	528	217	70.0%	13'50"	83.00
Des Moines	419	419	624	305	49.2%	12'25"	74.46
El Reno	240	240	418	178	74.2%	13'55"	83.50
Council Bluffs	250	217	340	132	60.9%	13'00"	78.00
Cedar Rapids	244	244	363	119	48.7%	12'05"	72.60
Total These Yards	4,301	3,923	6,166	2,243	57.2%	13'45"	82.50
Surplus		378	8.6%				
Per cent of Available			91.2%	Used			
Number Jobs per Engine Used			1.6				

Fig. 3.—Productive Hours of Engine Service, Determined from Freight Terminal Performance Report

it would be of little value as a corrective measure, for which purpose it is intended and used. There has been no single influence which has had as great an effect on yard operating costs as the daily freight terminal performance report and the Y.T.O.-1 report.

Utilization of Yard Power

One of the most direct economies secured through the closer supervision given yard matters has been the utilization of yard power available for service. The practice of keeping engines under steam to protect assignments results in more fuel consumption, additional roundhouse expense, loss in time by yard crews, etc. Controlling the use of engines on more than one assignment and arranging such assignments to permit the working of engines through 16 hours instead of 8, develop reductions in all of the items of transportation chargeable to engine operation, and provides an increased utilization of the yard engines worked. This is indicated by Fig. 3 which shows a portion of a record compiled from the daily freight

ROCK ISLAND LINES FREIGHT TERMINAL PERFORMANCE																								
ENGINES					HOURS LOST AND DEPARTMENTAL SERVICE					ENGINE HOURS					PAY ROLL					CARS HANDLED				
DATE	AVAILABLE	USED	PERCENT	REMARKS	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME	TOTAL	STRAIGHT TIME	OVER TIME
1																								
2																								

Fig. 2.—Consolidated Report of Freight Terminal Performance

information covering the previous month at a time when there is ample opportunity to correct adverse conditions reflected in the previous month's operation. At the close of each calendar year the monthly totals for each yard are combined into the year book; the yearly record being issued in the same form as the monthly report.

The issuing of this record promptly depends upon the systematic handling of the records in the general office.

terminal performance report. Only part of the complete record is shown, but this report covers all yards working more than three shifts per day. It will be noted from this chart that the productive hours of all engines used during the month at these nine yards averaged 13 hr. and 45 min. per engine; to get this average 57.2 per cent of all of the engines used worked 16 hours or longer per day, giving an average of 82.50 miles per

engine per day on the basis of six miles per hour.

There has never been a time since March 1, 1924, when these yards did not have sufficient yard power, nor did they ever have more engines than justified; however, by close supervision and utilization of their power, it will be noted that there was a working surplus of 8.8 per cent in the power available for service and that only 91.2 per cent of the power available for service was used. The utilization of power at these yards resulted in 378 less engines being fired up, and passed over cinder pits, through the roundhouse, and to the washout plant.

Service Not Sacrificed

The ultimate aim of such activities could only be to the end that yard expenses should show a reduction, and

and passenger total) of \$0.7278 to the low figure of \$0.4324 in July, 1926. It will also be noted that the average cost per car per year has steadily decreased year by year, a vivid indication of the restricted expenses regardless of an ever-increasing volume of traffic handled.

Overtime Reduced

Another feature of yard operation that is ever present in the minds of those responsible for expenses, is the overtime paid yard enginemen and trainmen; the time and one-half feature resulting in an increase of one-third in wages paid. The extensive campaign inaugurated against overtime is reflected in Fig. 4, which shows the percentage of increase or decrease in yard engine overtime during each month, compared with the same month of 1923-24. From this chart it will be determined that since March 1, 1924, there were but four months (in 1926) when the overtime exceeded that of the same month of 1923, and that there has been an average reduction of 23.4 per cent per month during the three years compared. The 1926-27 period does not afford as favorable a comparison as the two previous periods, due to the overtime brought about by the industrial and oil field developments, but in the train yards the decreases are just as remarkable as during the 1924 and 1925 periods.

Fuel Also Saved

The reflection in Fig. 5 shows the pounds of coal consumed per yard engine mile worked from March 1, 1924, to February 28, 1927, the three yearly periods since the inauguration of the supervisory organization of yard operations. Reference has been made to the working of engines through 16 hours and reclassifying assignments to permit engines to be used on two or more jobs during the 24 hour period; not only this, but other influences have

brought about a saving in yard engine fuel.

On first thought it would appear that a restriction in yard engine miles would result in engines being worked under a heavy load, resulting in an increase in the fuel consumption. This might be sound theory if it was a fact that the engines had always been working under a maximum load, but if it developed that engines had not been used to their maximum and that they were burning a determined amount of fuel under a light load which would be sufficient to operate the same engine under a maximum load, then the conclusion must be that while the engines burned a certain amount of coal per mile, this coal must have been in part wasted by the engine while not in actual productive service, either idle on the job or burning fuel while on "ready" tracks or held waiting other assignments.

The downward trend of the figures covering fuel consumed per engine mile may be determined from Fig. 5, showing the average for the 1923-24 period—163 lb.; 1924-25 period—162 lb.; 1925-26 periods—154 lb.; and 1926-27 period—152 lb. per yard engine mile worked. This reduction in coal consumed resulted in a saving of \$82,573 per year in the amount of coal consumed by yard engines.

Many Cars Light-Weighed

An integral part of the improved yard operations was the increase in the light-weighting of cars. Under the

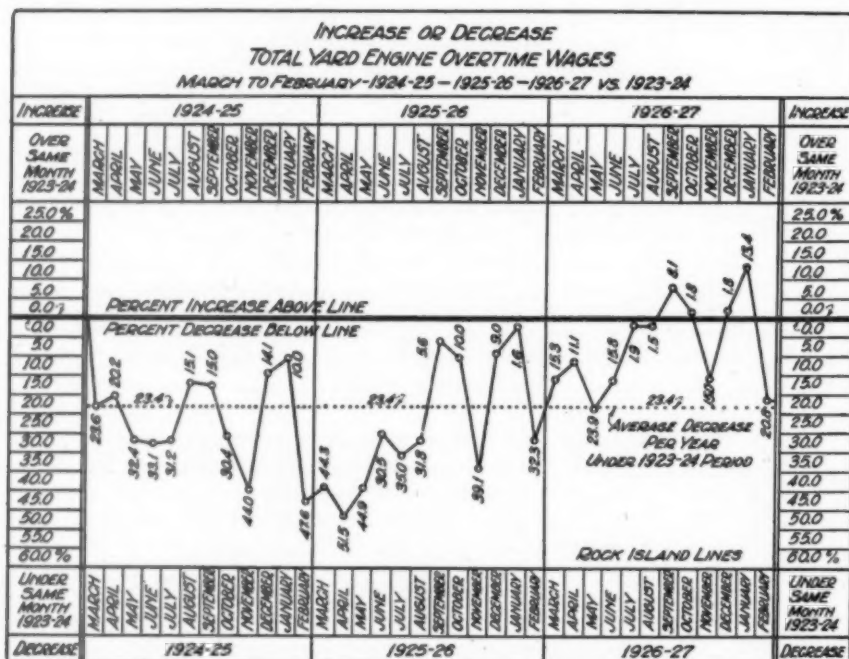


Fig. 4.—Yard Overtime Shown a Material Reduction

that such a reduction should be obtained without sacrifice of service. The first purpose of yard engine operation must be that of service, and it has been that on the Rock Island Lines. Never in the history of the railroad has the terminal service been as adequate and satisfactory to patrons as during the past three years. The reductions in one branch of the yard service (train yard) have more than offset the expenses brought about by more adequate service in the industrial centers; this has been accomplished successfully and the unit costs brought down year by year.

This is reflected in Table 1, which shows the life line of the transportation costs per car handled in yards, by months. Attention is called to the descending trend of the line from February, 1923, with a cost per car (freight

Table 1—Total Yard Operating Cost Per Car Handled

	1923 c	1924 c	1925 c	1926 c
January	67.46	67.40	56.88	53.68
February	72.78	60.38	57.74	52.07
March	67.13	59.30	53.79	50.51
April	60.35	57.63	49.83	48.66
May	60.38	53.73	47.65	45.69
June	56.39	52.09	44.31	43.57
July	55.09	49.18	48.71	43.24
August	57.70	53.52	46.67	46.94
September	56.85	51.73	46.98	49.24
October	56.80	49.07	49.35	48.80
November	57.21	53.09	51.36	54.17
December	61.36	62.56	54.98	55.48
Average for year.....	60.79	55.80	50.68	49.33

rules, a charge of \$4.15 per car is made against the car owner for the light weighing and restenciling of equipment; this charge, when made against an owner line, means an offset in a like charge made against the line performing the service, as most lines have some cars away from the home rails during the period when the car is subject to light weighing by the holding road. This matter is one of vital importance and is not always appreciated to the extent of taking advantage of the opportunity of saving the expense.

A campaign was started on this important matter in 1924; the result by months is reflected in Table 2, which shows the cars light-weighted and restenciled for car owners other than the Rock Island during the years 1923-24-25 and 26. The average number of cars restenciled per month has constantly increased since 1923,

Table 2—Foreign Cars Restenciled Under M.C.B. Rules

	1923	1924	1925	1926
January	218	206	251	416
February	226	245	396	543
March	322	398	771	918
April	346	666	795	936
May	331	664	885	1,012
June	490	645	570	937
July	640	586	514	1,085
August	412	388	698	889
September	421	450	532	728
October	368	442	418	668
November	355	454	369	534
December	262	245	342	473
Total	4,391	5,389	6,541	9,139

being 335 cars per month in that year, 449 cars in 1924, 587 cars in 1925, and 763 cars in 1926; resulting in M.C.B. bills credit amounting to \$29,150 per year during the last three years, compared with \$16,678.00 in 1923,

an increase of over 74 per cent. Special interest is indicated in the comparison of the peak month of 1923 with 640 cars and of 1926 with 1,085 foreign cars light-weighted. This improvement was largely brought about by the activity of the yard employees and car inspectors, all of whom entered into the effort with interest.

This campaign had a good effect not only on the light-weighting of foreign cars but also in disposing of Rock Island equipment, thus preventing like bills being rendered against our equipment by foreign lines. Table 3

Table 3—System Cars Restenciled Under M.C.B. Rules

	1923	1924	1925	1926
January	938	943	1,878	2,519
February	1,042	1,065	2,310	2,527
March	1,290	1,841	3,360	3,480
April	1,878	2,703	2,880	3,541
May	2,244	2,986	3,022	3,920
June	2,693	3,495	3,508	3,715
July	2,538	3,406	2,266	3,222
August	2,040	2,170	2,550	2,906
September	1,956	2,462	2,013	2,599
October	1,984	2,131	1,834	2,631
November	1,410	1,940	1,569	2,282
December	896	1,349	1,696	2,245
Total	20,909	26,491	27,886	35,587

shows the performance in the light-weighting of Rock Island equipment on our line during the same period covered by the foreign equipment chart. It is sufficient to say that during 1926 the Rock Island equipment restenciled represented 70 per cent of the total Rock Island ownership of freight cars, leaving a very small margin for other lines to work on if cars in the remaining 30 per cent should reach foreign lines. Among the system cars restenciled are included, of course, those cars passing over repair tracks and receiving alterations requir-

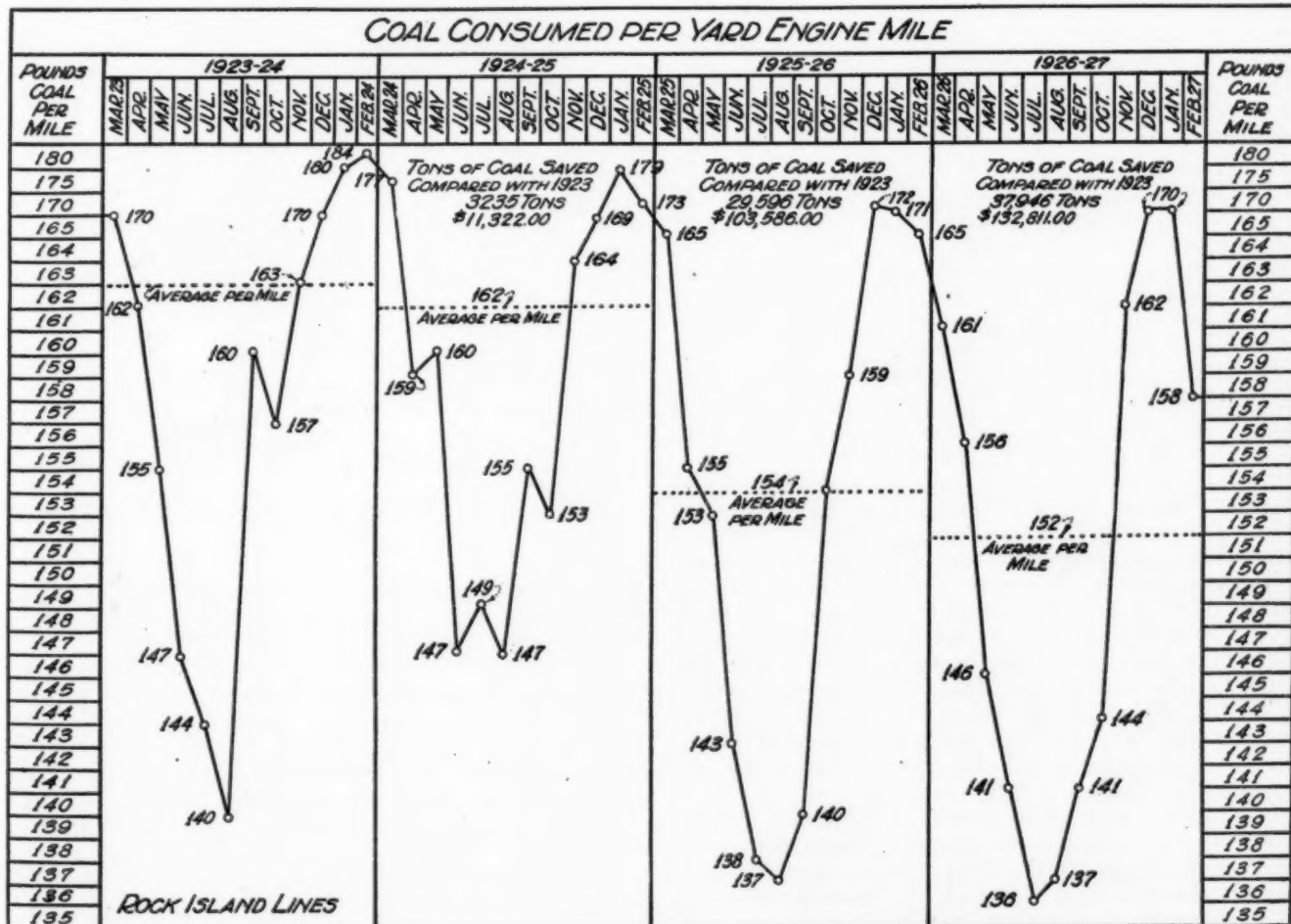


Fig. 5.—Supervision Resulted in Large Savings in Fuel Costs

ing reweighing of the car, but this represents a small percentage of the total system cars light-weighted and restenciled. A great deal of the light-weighting of equipment is performed by yard crews during hours when there is a slack period in the yard work. It is an excellent and economical method of getting service from yard crews which would otherwise represent lost time.

Train Operation Supervised

In connection with general yard supervision, the train operation into and out of terminals was made a matter of special supervision. The prompt handling of trains is one of the requisites of successful yard operation; terminal overtime is expensive and money spent for which no service is returned. Train tonnage is largely in the hands of the yardmaster and those building up the trains; also the classification of traffic to insure the proper movement of that part of it belonging in certain time freight trains, and the confining of such traffic to proper trains. The terminal detention of road power and other items of train operation are thoroughly covered by a terminal dispatchment record, form C.T. 52.

This report covers a 24-hour period and includes inbound and outbound train records, classifications and terminal delay reports. Information shown on the inbound train record includes: train, symbol, engine number, direction, conductor, engineer, time of arrival, loads, empties and tons. The outbound record gives similar information as to the train and crew and also includes the following: time connection arrived, time engine O.K.'d for, time crew called for, time train made up, time engine placed on train, time inspection completed, time train left yard and total terminal delay.

From the terminal dispatchment record can be checked numerous features of train handling at terminals, as this report is rendered daily by each train yard, showing the information on trains received and dispatched. This gives the yardmaster close supervision over the handling of power and crews, the makeup of trains, tonnage and terminal delays. In like manner it gives information of the same nature to division and district officers and makes it possible for certain records to be compiled in different offices, showing the performance of trains, which could only be secured by train sheet records and which are not available promptly after the operation of the trains, especially by division officers not located at the division headquarters, or on divisions where two or more dispatching offices are situated.

From this record it is also possible to keep a close check on the nature of the traffic being dispatched from each yard, and to permit close study of the requirements of such traffic as to its classification or dispatchment. Through this method it is possible to revise certain classifications, consolidate others, move others in solid trains and confine them to certain daily movement to avoid delays to other traffic, and still serve the same results as to terminal deliveries. Form C.T. 52 gives a history of every train movement at the dispatching yard, and is, in a measure, the train sheet covering the yard performance, the same as the train sheet in the dispatcher's office covers the between-terminal movements. With this record and the train sheet the division officer has complete data covering the performance of trains, engines and crews of his division; something he had before only in part.

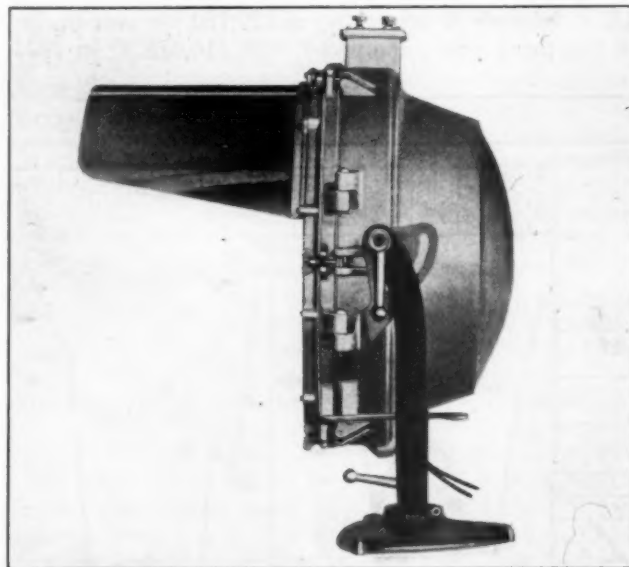
One of the uses made of Form C.T. 52 is that it forms the basis of a report covering trains dispatched on the direction of heavy traffic. This report gives the district and division officers a record of their train performance as to the tonnage handled, traffic dispatched in such trains, and speed per hour between terminals, thereby

enabling them to determine the cause for running light trains in the direction of heavy traffic. This record is checked daily from the terminal dispatchment record and a report given one division daily so that each day the district officers and one division superintendent have a report covering a division of the railroad. This record has also brought out features from the terminal dispatchment record which have enabled division officers to check other matters, and is one of the numerous methods of advancing more systematic supervision and regulation of conducting transportation.

A 24-Inch, Long-Range Floodlight Projector

A 24-INCH floodlight projector, known as the type SCA-24, has been developed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., particularly for railroad yard lighting and similar applications where long throw and high beam candle power are essential. The large diameter of the reflector makes possible a wide angle of light with high overall efficiency. Its long focal distance gives good beam concentration for long range work.

The 24-inch parabolic, chromium plated brass reflector is mounted on a cast aluminum alloy frame with a spun sheet aluminum back. The lens, of heat resisting



Side View of Westinghouse Type SCA-24 Floodlight Projector

glass, is held in a door which opens from the front, swinging sideways. Thus it is possible to renew lamps and clean the reflector without door interference.

The floodlight is mounted so that it can be tilted upward where its position is such that approach from the front is not practicable. A stop is provided so that it is unnecessary to aim the projector each time it is moved from position. Focal adjustment is provided by three screws, which operate independently, two for "in" and "out" and lateral motion of the lamp, and one for adjustment of focal distance.

The reflector is entirely enclosed, no ventilation being required. It is furnished with either narrow or wide beam projector and with either plain or spread lens. The visor is supplied as an accessory.

Full Gear Versus Limited Cut-Off*

A discussion of the advantages obtained by limiting the cut-off from the standpoint of capacity and economy in locomotive operation

By H. J. Vincent

Franklin Railway Supply Company, New York

TO operate a railroad successfully on the theory of maximum ton-miles per train hour locomotives must be rated at the power which they will deliver at the maximum operating speed, then be furnished with sufficient starting capacity to get the train under way, when confronted with the most adverse conditions. This combination of requirements can only be satisfactorily met when a boiler and grate having the capacity to furnish steam economically and cylinders which will deliver a horsepower for the minimum expenditure of steam, are provided. For the boiler to produce steam most economically, the grate area must be of sufficient size to obtain the rated horsepower and a certain percentage of overload without necessitating a high combustion rate. From 60 to 100 lb. of fuel per sq. ft. of grate per hour has proved to be the most desirable rate.

The value of utilizing the expansive properties of steam was familiar to Watt and Stephenson, but, curiously enough, except in certain sporadic instances, this principle was not applied in locomotive design until in 1916, when the Pennsylvania built a locomotive in which the maximum cut-off was fixed at 55 per cent of the stroke. This locomotive was operated successfully for a year, both on the testing plant and in road service. The economies which it gave were so marked that the Pennsylvania adopted it as the standard freight locomotive, and today there are 598 in service.

While it might seem curious that the railroads have waited so long to take advantage of the expansive properties of steam, there is a basic reason for the delay. Many of us can recall the time when fuel could be put on the tender for \$1.00 per ton. Economy in its use was, therefore, rather an academic question, very little time or thought was expended on a device whose sole merit was fuel economy. Today coal costs around \$5.00

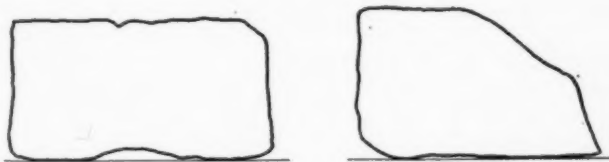


Fig. 1—Full Stroke Cards of a Full-Stroke Cut-Off Locomotive and a Limited Cut-Off Locomotive

per ton; consequently, there are but few roads without fuel conservation departments.

While the limited cut-off locomotive had been used abroad to a very limited extent, its use in this country until about 18 months ago was confined to a single railroad. Therefore, there is a pardonable lack of current information regarding the principle on which it operates and, naturally, some misinformation is in circulation regarding it.

* Abstract of paper presented at the May 12, 1927, meeting of the Central Railway Club, Buffalo, N. Y.

In the conventional design of locomotive, the maximum cut-off is fixed at from 88 per cent to 91 per cent of the stroke. In the remainder of this discussion, such a locomotive will be referred to as a full gear cut-off. A characteristic indicator card from such a locomotive is shown in Fig. 1. This is what is known as a rectangular cycle and represents a great waste of fuel, as steam follows the piston for nearly the full stroke and

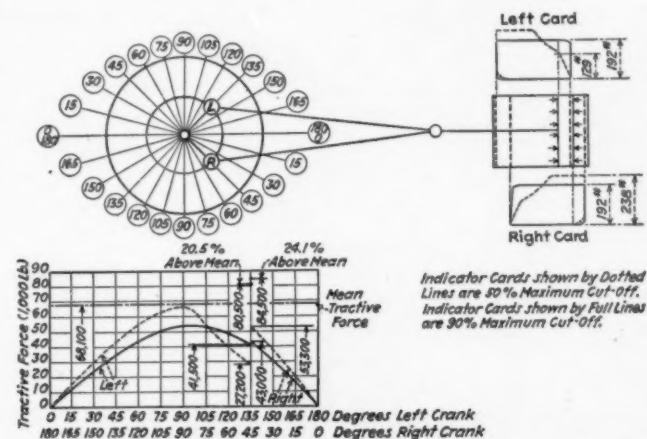


Fig. 2—Relative Effect of Full-Stroke and Limited Cut-Offs on the Combined Tractive Forces of the Right and Left Driving Wheels

is exhausted as a pressure only slightly lower than the working pressure.

In a limited cut-off locomotive the valve gear and valve characteristics are so arranged that it is impossible to operate the locomotive at any longer cut-off than that for which it is designed. This usually varies from 50 per cent to 65 per cent of the stroke, depending upon the service requirements. Fig. 1 also shows an actual indicator card from a locomotive designed for 60 per cent maximum cut-off. You will observe that after cut-off the steam expands, thereby doing a large proportion of its work after it is cut off from the boiler. It is exhausted at a relatively low pressure, representing a large economy in heat which is thrown away with the "rectangular cycle" shown.

The question is frequently asked why a limited cut-off locomotive (which must necessarily have a higher working pressure or a larger cylinder) can operate at a lower factor of adhesion than can a locomotive with full gear cut-off. Fig. 2 illustrates this point.

All the essential elements of a locomotive are indicated diagrammatically. The cranks are placed in the position where slipping normally occurs. Typical indicator cards for both full gear and limited cut-off are shown below the cylinder for the right or leading crank, and above the cylinder for the left or following crank. Owing to the crank positions the pistons in both the

right and left cylinders are equally distant from the ends of the stroke.

The right crank having moved through an angle of 45 deg. from its full forward position, the right piston is exposed to full working pressure, which is 192 lbs. for the full gear cut-off and 238 lbs. for the limited cut-off. The left crank has moved through an arc of 135 deg. from its back dead center, and the left piston has passed the cut-off point on the limited cut-off for the full gear card. The relative pressures are 129 lbs. for the limited cut-off engine and 192 lbs. for the full gear engine.

The chart at the bottom of Fig. 2 represents by curves the tractive force developed at each crank during

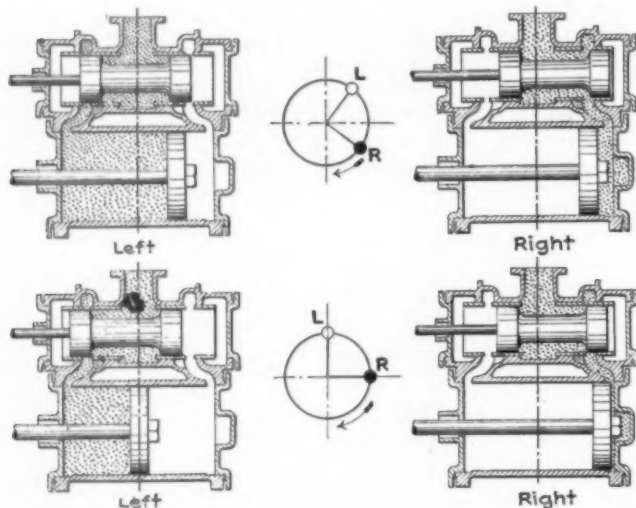


Fig. 3—Diagrammatic Illustration of the Functions of the Starting Ports

rotation from its respective dead center, the dotted lines representing the limited cut-off, the full lines the full gear cut-off. With the crank positions shown in the diagram the momentary tractive force delivered is as follows:

	Right crank	Left crank	Both cranks
Full gear cut-off.....	43,000 lb.	41,500 lb.	84,500 lb.
Limited cut-off	53,300 lb.	27,200 lb.	80,500 lb.

As the cylinders are of equal power, the mean tractive force for one complete revolution is 68,100 lbs.

A nominal factor of adhesion of four is considered satisfactory for a Mikado locomotive having full gear cut-off. However, at the peak of the torque curve, this factor will be reduced in the present example to:—

$$\frac{4 \times 68,100}{84,500} = 3.24$$

If, under this condition, slipping does not occur, it is reasonable to assume that a locomotive having its cut-off limited to 50 per cent of the stroke, will operate as successfully with a normal adhesive factor of

$$\frac{3.24 \times 80,500}{68,100} = 3.83$$

Very few persons question the advantage of using steam expansively, but there has been a great deal of discussion regarding the capacity of a limited cut-off locomotive to start a heavy train under all conditions. It is obvious that without some special starting means it would be practically impossible to start such a locomotive without taking slack very carefully so as to bring the one effective crank into a favorable position.

The starting means which has been employed on all the limited cut-off locomotives so far built in this country was devised by W. F. Kiesel, mechanical engineer,

Pennsylvania, and consists of small slots in the valve bushings which are lapped by the valve when in its central position. These slots are usually made $\frac{1}{8}$ in. wide by $1\frac{1}{2}$ in. long, and communicate with the main steam passages between the valve and cylinder.

A diagrammatic view of this starting arrangement is shown in Fig. 3, which indicates two positions of both the right and left cylinders. In the bottom views the right piston is beginning its backward stroke and is exposed to full steam pressure, but as its crank angle is zero it cannot transmit any turning effort. The left piston has reached cut-off position of the main port; consequently, it would be impossible to start the locomotive without taking slack.

With the starting ports, steam can enter the left cylinder through the small slot indicated and exert pressure on the piston until it reaches the position shown in the upper figure of the diagram. At this point the small port is cut off by the valve. It will be noted that the right crank has now reached a favorable angle which will permit starting the locomotive without taking slack. The cut-off position of the auxiliary port is from 80 per cent to 85 per cent of the stroke. This starting means is extremely simple, efficient and entirely automatic.

While those who have given the subject sufficient study realize the necessity for providing some starting means in a limited cut-off locomotive, there are others who claim that such means are not necessary to start a locomotive successfully having the cut-off limited to 70 per cent of the stroke. That such reasoning is fallacious will be proved by referring to Fig. 4. In this figure the points *a* represent the positions of the cranks of a locomotive having full gear cut-off at the instant that the valve has just closed the steam port governing the following crank. This is the position in which the locomotive will have the minimum starting force. If we take as an example a locomotive having 28-in. by 30-in. cylinders, 63-in. driving wheels and 200-lb. boiler pressure, with 90 per cent maximum cut-off, the nominal

Cylinder	Driver Diam.	Boiler Pressure	Cut-Off Main Ports	Starting Ports	Nominal Starting Force	Minimum Starting Force
28" x 30"	63"	200 lb.	90%	None	68,700 lb.	43,400 lb.
28" x 30"	63"	211½ lb.	75%	None	68,700 lb.	27,750 lb.
28" x 30"	63"	211½ lb.	75%	With	68,700 lb.	43,400 lb.

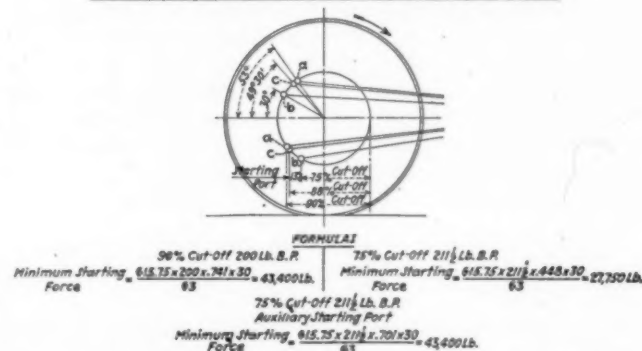


Fig. 4—Effect of the Starting Ports on the Minimum Starting Force of a Limited Cut-Off Locomotive

tractive force will be 68,700 lbs. If this engine is required to start with the cranks in the position shown, the starting force is reduced to 43,400 lbs.

Assume now a similar locomotive having the same size of cylinders, but with the cut-off limited to 75 per cent of the stroke. With this reduction in cut-off it will be necessary to increase the boiler pressure to 211½ lbs. to obtain an equal nominal starting force of 68,700 lbs. We will further assume that the starting ports are omitted. The circles *b* will then indicate the position of the cranks at the moment of cut-off of the main steam

port. In this position the leading crank is only 30 deg. from the back dead center, giving a maximum starting effort of 27,750 lbs., or only 64 per cent of that given by the locomotive with full gear cut-off.

By the addition of auxiliary starting ports, the virtual cut-off is lengthened to 88 per cent of the stroke. The position of the cranks will then be as shown by the circles *c*, and by this means starting effort is increased to 43,400 lb., equal to that of the full gear cut-off.

It is obvious from this illustration that for any cut-off less than the maximum with which it is compared, auxiliary starting ports must be provided to give equal starting power.

The two outstanding reasons for the adoption of the limited cut-off principle in locomotive construction are increase in capacity and economy in fuel. Both of these desirable objects may be realized in the same design. While the major portion of the fuel economy is attributable to the reduction in cut-off, a significant measure of it is due to the improved valve conditions which accompany the limitation of the maximum cut-off.

There is a decided tendency today toward longer valve travel as a means of improving valve events and reducing the loss through wiredrawing of the steam into the cylinder at short cut-off.

It is obvious that if the maximum cut-off is reduced in any given locomotive the power will also be reduced until the locomotive reaches the speed at which its sustained power is dependent upon boiler capacity. Let us assume, for example, a locomotive having 28-in. by 30-in. cylinders, 63-in. driving wheels, 200-lb. boiler pressure and a maximum cut-off of 90 per cent. The nominal tractive force of such a locomotive in accordance with the usual formula is 63,400 lbs. If this locomotive was built to deliver the same nominal power with a maximum cut-off of 60 per cent either the boiler pressure or the cylinder volume must be increased. Assuming that an increase in pressure was most desirable, then a pressure of 228 lbs. is required, or if the same pressure is retained then a cylinder diameter of about 31½ in. is needed. On account of the large diameter of cylinder required it is preferable to increase boiler pressure.

It is important to note here that the application of limited cut-off to a locomotive involves an increase in the weight, as higher pressure requires heavier boiler plate and more substantial staying and bracing. It also necessitates an increase in the strength of the running gear, in direct proportion to the increase in pressure.

Where the required power is obtained by an increase in boiler pressure, the weight increase will approximate 4½ per cent of the locomotive weight. If the pressure remains the same and the cylinders are made larger the weight increase will approximate 3 per cent. To take full advantage of the increased power at speed, the limited cut-off locomotive should be equipped with a booster to give the necessary starting power and provide acceleration at low speed.

It is well known that a switching locomotive works habitually in full gear cut-off, also that its operating range of speeds is very low, possibly from 2 to 12 m.p.h., averaging at the most about 4 or 5 m.p.h. Therefore, it is constantly operating under the most favorable conditions for large fuel saving. Thirty per cent of the fuel may be saved in this class of power by limiting the cut-off without incurring the slightest operating disadvantage. The experience of the roads which have used limited cut-off switchers is that they are better starters than the conventional locomotive, as well as superior in accelerating their trains.

The saving in fuel is more pronounced where the limited cut-off locomotive operates at such speeds that the maximum cut-off difference exists between it and

the ordinary type of locomotive. However, on account of the higher pressure employed, the limited cut-off locomotive always operates on a shorter cut-off than the conventional locomotive, at any speed; therefore, it will show economy in fuel throughout the whole range of speeds, or this economy may be translated into additional power at speed, if desired, as the limited cut-off will produce a horsepower for a smaller expenditure of steam.

In applying the limited cut-off to passenger locomotives, the designer must give consideration to the reciprocating weights which would normally be increased through the use of higher boiler pressure. This handicap may be overcome by care in design of reciprocating parts and use of the better grades of steel.

There are two other factors which tend to compensate for the increased reciprocating weights, one is the increased length of wheel base, and the other is the higher compression in the limited cut-off locomotive due to the use of an exhaust lap.

Without going into details it may be stated briefly that the simple Mallet locomotive offers a very attractive field for the use of limited cut-off, as its range of operating speed is such that the maximum economy in fuel can be realized. With full gear cut-off it is difficult to get sufficient boiler capacity for the large cylinder volume. Reducing the maximum cut-off is equivalent to increasing the boiler capacity.

Within the past few years there has been an increasing demand for greater fuel and water capacity on tenders. This has been brought about by long runs and the tendency to higher average operating speed. The limited cut-off by increasing the operating radius of a locomotive, through economy in the use of fuel and water, offers a better solution than an increase in tender capacity.

While the initial cost of the limited cut-off locomotive will exceed that of the plain engine on a nominal tractive force basis, it will not be operated on that basis. Therefore, it would seem more logical to base the comparative purchase price on the power which the locomotive will deliver at the operating speed, and in addition take into consideration the fact that the limited cut-off locomotive will save from 5 per cent to 10 per cent of its cost annually in fuel and water. On this basis of calculation, which is a just one, the limited cut-off locomotive will prove to be the better bargain.

Intimate Contact with Men Will Stop Rough Handling*

By O. Maxey

Superintendent Freight Loss and Damage Prevention, Chicago, Rock Island & Pacific

OPERATING restrictions arbitrarily drawn with the purpose of adapting the entire switching performance to the demands of commodities of low resistance, could have the effect of actually reducing yard capacities by retarding operation. This would be accompanied by delay and congestion because of a more difficult movement. It is probable that the prevention of damage in this way would be more than offset by the loss of efficiency in operation.

It is plainly seen that the degree of impact deemed legitimately accessory to the movement of cars has been increased by the growing density of traffic and the greater weight of units of traffic as represented by the average

*Abstract of address made before the annual meeting of the Freight Claim Division, American Railway Association, at Quebec on June 14-17.

of carloads. Recognizing that as fact it is apparent that a measure of compensation must be sought by the correction and amplification of specifications applied to the loading of commodities of low resistance.

The fact of damage is frequently established by hearsay evidence, the cars being at remote industries and in the process of unloading when the damage is reported. An opportunity for the inspection of the commodity in cars to determine the loading plan or to verify the allegation of rough handling by noting the condition of the load is not given. The popular notion of inspection is merely to provide a record of damage that will pass muster in the verification of the claim. The result is too often a superficial sketch of the conditions which is confusing, contradictory and impossible of profitable analysis. The correction of this condition is the first step to be taken in an effort to reconcile the elements inherent in commodities and distribution methods.

There must be at the same time a further scrutiny of the conditions surrounding carloads in transit, and this must be undertaken by individual lines. The measure of the resistance existing in terminal and other facilities, the volume and peculiarities of traffic, and the factor of time in switching, should be accurately known. A correct appraisal of these elements is necessary and may enable a revision of the practice with a consequent benefit to service.

The attitude of employees commonly reflects the interest of authority in any performance. The technique of switching is a matter of less consequence than the existence of a definite policy that respects the traffic and is designed to afford it every possible protection. The moves to be made and the precautions to be taken to insure safe handling are well within the understanding of those concerned and it remains only to keep the policy in sight by appropriate supervision.

Prejudice attends and hampers the introduction of innovation because an existing and established order of things, time-honored and comfortable, is disturbed by change. It yields eventually to consistent discipline and evidence of the advantage in corrected practice. There must be in any connection a harmony of effort inspired by an understanding of the benefits to be derived from the new order, and an appreciation of the conditions under which the work is to be done.

The correction of rough handling will not be accomplished by long distance methods. It cannot be assumed that any appreciable part of the literature now being distributed in volume with the object of creating and sustaining interest, statistical, educational, even instructional, will be read and digested. There must be an intimate personal contact with the men by men, an intuitive and sympathetic grasp of their problems, an appreciation of the mental attitudes produced by their environment, together with a knowledge of operation that will permit an intelligent discussion and promote respectful attention to the views presented. It is necessary to clearly establish the switching of cars as an important factor in the solicitation and delivery of service, and the conservation of revenues derived therefrom.

When the subject has been properly presented in all its phases, there is no better way to maintain interest in the careful handling of cars than by the collection of evidence in specific cases of rough handling which identifies beyond question the place and hour of occurrence and the degree of impact. Investigation brings the men concerned face to face with the fact of rough handling and invites review of the circumstances attending the incident. Discipline is recommended in extreme cases where the evidence of rough handling supplied is not followed by a consistent improvement.

Looking Backward

Fifty Years Ago

The master mechanic of the Philadelphia & Reading, at the Master Mechanics Convention, told of dispensing with all engine wipers at a saving of \$285 per day, which was being put aside in a fund to cover any depreciation which might arise from the change in policy.—*Railroad Gazette*, July 27, 1877.

A saving of 15 to 20 per cent in fuel is claimed for locomotives that are equipped with a feedwater heater which has just been placed on the market. The device has been applied to a number of locomotives on the Old Colony [now a part of the New Haven], being placed just below the boiler, immediately behind the leading truck.—*Railroad Gazette*, July 27, 1877.

Jay Gould, president of the Missouri Pacific, made no secret of his opinion on July 26 that the railroad strike with its terrorism and bloodshed in Maryland and Pennsylvania is the beginning of a great social revolution, which cannot be arrested until it has led to the destruction of the republican form of government in this country and the establishment of a monarchy.—*Chicago Railway Review*, July 28, 1877.

During the last few days of July practically all railroads involved in the great strike reached some form of wage agreement, the strikers returning to work. By August 1 service had been practically restored to normal. The roads in the Southern states, the New England states, the extreme Northwest and the Pacific coast suffered no interruption. The postmaster general has made the decision that railroad companies are not expected, and cannot be compelled, to carry mails on any but regular trains, and that whoever interferes with the running of these is responsible for the delay of the mails.—*Railway Age*, August 2, 1877.

Twenty-Five Years Ago

A grain elevator with a storage capacity of 650,000 bushels in which all the bins are constructed of rolled steel plates, cylindrical in shape, has been placed in service on the Lake Shore & Michigan Southern.—*Railway and Engineering Review*, August 2, 1902.

On July 25 a car equipped with ball bearings and loaded with 75,000 pounds of castings was shipped from Granite City, Ill., to New Orleans over the Illinois Central. It is claimed for this ball bearing that a car loaded to its utmost capacity can be moved with one-fifth the motive power required in moving an ordinary freight car.—*Railway and Engineering Review*, August 2, 1902.

Construction is actively under way for the "Moffat road" which is projected from Denver westerly over a formidable wall of the Rocky mountains to Salt Lake City to connect with the Clark road that is slowly building between Salt Lake and Los Angeles. The Burlington and the Rock Island are each or both assumed to be behind the project, which will greatly shorten the distance from Colorado to Southern California.—*Railway Age*, August 1, 1902.

Ten Years Ago

The Reed "bone dry" amendment, which became effective on July 1, makes any railroad which carries liquor into a dry county, city or state, guilty of a violation of the law. The shipper and carrier have equal responsibility, and either or both may be prosecuted.—*Railway Review*, July 28, 1917.

The Interstate Commerce Commission on July 24 rendered a decision in the various cases involving transcontinental freight rates, in which it finds that existing water competition is a negligible factor in affecting the rates by rail between Atlantic and Pacific coast terminals.—*Railway Age Gazette*, July 27, 1917.

New Books

Human Relations in Railroadings, by Hayes Robbins. 160 pages, 5 in. by 7½ in.. Bound in cloth. Published by the General Publishing Company, 30 Church street, New York. Price \$2.00.

Few if any competitions for articles on important questions promoted by technical or business publications have attracted so widespread attention or been so productive as the one which the *Railway Age* held three years ago on suggestions for co-operation between the managements and the workers in the interests of greater efficiency and economy of operation. There is little question but what the publication of many of the contributions entered in this competition has done much to stimulate a greater interest in the human relations problem on the railroads. Mr. Robbins' book tells of the progress made on one railroad in attempting to induce a greater amount of hearty and intelligent co-operation through bringing about closer contacts and better understandings between the representatives of the management and the workers.

The first move was to make a survey of the problem to determine "definite elements of friction, misunderstanding and indifference revealed in some degree in various branches of the service, suggest some of the probable underlying causes and offer a number of recommendations."

It should be noted that the president of the railroad was keenly interested in finding a solution to the problem of better human relations and was prepared to back up any reasonable and logical program. It is significant, also, that no attempt was made to impose any scheme of personnel administration, but that as far as possible the work was done without the sound of trumpets and without setting up any elaborate or special machinery. The work was carried forward, rather, on a more or less experimental basis and methods and practices gradually improved and extended according to the results of such experiments.

One of the first problems for consideration was how to bring about closer personal contacts between the management and the workers. It was found that there already was a certain amount of machinery for the making of such contacts, including for one thing, the monthly meetings of the safety, fuel conservation and freight claim prevention committees. The story of how these activities were extended and intensified with excellent results, forms one of the most interesting chapters in Mr. Robbins' book. Then came the experiment with the establishing of foremen's clubs. Progress was slow at first and the movement really got off with a wrong start. Observation and study, however, located the weaknesses of the first experiments and a new start was made, which finally resulted in the formation of nine successful clubs with "substantial savings and increased efficiency as the direct consequence of information and instruction made available through this means to the supervisors, as well as of the incidental discovery of wrong practices and understandings elicited largely through the questions and discussions." Incidentally, also, after the clubs had been in operation for a couple of years it was found that most of the foremen in the mechanical department had enrolled in special correspondence courses prepared for supervisors.

It became evident that there was a gap between foreman training and apprentice training, which very much needed to be filled. In the chapter on "Adventures in Education," Mr. Robbins tells of the problem of educating the adult employees and various experiments which were made in such training. Another chapter tells of an experiment in suggestions, which resulted finally in the installation of a formal plan for encouraging the employees to make suggestions for improvements.

An employees' magazine was established and Mr. Robbins tells of some of the difficulties involved and principles upon which, in his opinion, a successful employees' magazine must be based. Much space is devoted to a consideration of insurance and pensions and of some of the problems which must be met and solved if these things are to be placed on a sound and substantial basis. Among other important matters considered are the regularization of employment, the extending of financial aid

to employees, provisions for the convenience and comfort of men at lay-over points, the responsibilities of management, and the handling of personnel work.

The final chapter entitled, "A Further Possibility," suggests the need for finding ways and means of forming a clearing house on experiments and experiences in personnel administration on the part of the railroads as a whole. This chapter is supplemented by an appendix with detailed suggestions as to the possible scope of the proposed service for the interchange of information on types of procedure, new undertakings and special studies in personnel relations. Another appendix includes a revision of an article on "Panaceas and Possibilities," contributed to the *Railway Age* by Mr. Robbins, in which he discussed the workings and possibilities of the Watson-Parker railroad labor law.

The book is gotten up in an attractive form and is one of the very few contributions specially devoted to the human relations problem on the railroads. Mr. Robbins has the faculty of thinking straight and expressing himself clearly. His New England upbringing prevents him from becoming over-enthusiastic and in spite of the fact that he was largely responsible for the inception and carrying forward of the experiments described, he has evaluated them in an impartial way and almost as one who was standing on the side lines and scientifically analyzing the various measures and their results. The book will be a help and inspiration to all of those who are interested in what may be regarded by many as the greatest problem confronting the railroad managements today—that of bringing about and insuring the best possible relations between the managements and the workers.

Books and Articles of Special Interest to Railroaders

(Compiled by Elisabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

The Apple Industry in the United States.—A Selected List of References on the Economic Aspects of the Industry Together with Some References on Varieties, compiled by Louise O. Bercau. Agricultural Economics Bibliography No. 19. See Index under "Terminal Facilities," "Transportation Facilities," and "Bureau of Railway Economics." 170 p. Issued by Library, U. S. Bureau of Agricultural Economics, Washington, D. C. Apply.

A Study of Fatigue Cracks in Car Axles.—A Report of the Investigation conducted by the Engineering Experiment Station, University of Illinois in Co-operation with Utilities Co-operative Research Committee, by Herbert F. Moore. Bulletin 165, Experiment Station. Pub. by University of Illinois, Urbana, Ill. 15 cents.

Supplement No. 1 to Complete Chronological List of All Decisions of the Supreme Court of the United States in which Each and Every Paragraph of the Interstate Commerce Act Has Been Construed, compiled by Arthur Gusack. Original list included in booklist for Oct. 23, 1926. This supplement brings it down to date. 3 p. Pub. by Author, Washington, D. C. \$1.00.

Periodical Articles

Colorado Tears Down Her Mountains, by Arthur Chapman. The Moffat Tunnel and Its History. On page 423 is a list of the world's longest railway tunnels. *World's Work*, August, 1927, p. 416-423.

Crowd Wanderlust, by Walter S. Hiatt. An appraisal of the "Let's go see!" tendency developed since the war which incidentally shows its effect on various forms of transportation. *Century Magazine*, July, 1927, p. 328-336.

Railroad Interest in Air Transportation. Perhaps we shall have air travel by day and rail travel by night. *Literary Digest*, July 23, 1927, p. 56-57.

Odds and Ends of Railroading

It is believed that the champion heavyweight railroad family has been discovered in the four Smith brothers (none of whom wear whiskers) who are employed by the Illinois Central at New Orleans. Their combined weight is 1,029 pounds, their combined service 42 years. Their father was also an employee of the Illinois Central.

"Royal Palm," a two-year-old carrier pigeon named after the Southern's limited train between Cincinnati and Florida, won the 500-mile old bird race of the Aero Raising Pigeon Club, covering the distance from Nappanee, Ind., to Washington, D. C., 506 miles, in 528 minutes, 57.48 m. p. h. In honor of the event the passenger department of the Southern has issued a 4-page illustrated folder giving interesting details about both "Royal Palms"—the train and its namesake.

Among the unusual freight shipments received by the Missouri-Kansas-Texas was a carload of bison, shipped recently from a bison ranch in Bud Mathews, Texas, to San Antonio. This bison ranch is steadily building up a large business and buffalo steak should soon be appearing again on dining car menus. All of which reminds us of the little known fact that "Buffalo" Bill got his name through supplying the Union Pacific construction gangs with bison meat in the early days of the West.

A passenger can now travel from Chicago to New Orleans by rail in almost exactly the same number of hours as it took days to make the trip 80 years ago. The trip by train now requires 21 hours. The Illinois Central Magazine for July quotes the letter of a traveler who in 1847 took 20 days to cover the same distance. The trip was made by stage coach from Chicago to Peru, Ill., by steamboat from Peru to St. Louis, and by steamboat again from St. Louis to New Orleans. Three highway and three river mishaps were chronicled enroute.

A peculiar traffic which has reached important proportions from a railroad standpoint has arisen in England by reason of the widespread interest in homing pigeons. The Railway Gazette (London) says that there are nine "combines", i. e., associations of pigeon fanciers' clubs, which have a total of 270,000 birds which they regularly send out each week to stated destinations by railway where they are liberated simultaneously for the journey homeward by wing. It is stated that the "Up North Combine" alone, representing 6,000 pigeon fanciers divided into 300 clubs and 22 federations, scheduled two trainloads of pigeons each week from May to August to various destinations.

On a special train bound for the Dempsey-Sharkey fight in New York some of the passengers were not content to be merely prospective fight spectators but instead tried to start a little battle on their own account with the train crew. Hostilities opened when a special agent for the railroad riding the train objected to the boisterous conduct of some of the passengers. The affair very nearly ended with wholesale arrests, but the offenders pleaded to be allowed to continue on their way and were finally permitted to do so. If passengers on special trains should acquire the habit of imitating a spectacle which they are journeying to see, this department would not like a place on the train crew of a special train going to a funeral.

A woman signing herself "a tolerant non-smoker" in a letter to the editor of the New York Herald Tribune advocates labeling all smoking cars of suburban trains. She says that the smoking cars are not always regularly placed in trains and that women frequently are embarrassed by finding themselves in a smoking car whereupon some man is sure to say "'smoker, lady,' in a low, confidential tone as if I were committing an awful indiscretion". This department sympathizes with the lady. No one, man or woman, ought to be inveigled into such premises unknowingly. On the other hand the insistence of some non-smoking passengers in taking up space in the smoker, which is generally very scarce, does

not arouse our sympathy much more than the unreasonable anger of some of the men passengers who conceal their ire very poorly every time a woman enters these sacred precincts, even if she is only passing through the car.

Sad Life of a Railroad Executive in Roumania

The recently appointed director of the Roumanian State Railways began his tenure of office under a rather unhappy augury if a press dispatch from Budapest is to be believed. The new director had heard that there was some dishonesty among the employees and determined to find out about it for himself first hand. Disguising himself with a set of false whiskers in true Sherlock Holmes style, he started on his way, and his troubles began immediately. The ticket agent forced him to pay double the scheduled fare, so runs the report. At the train gate the gateman declared that his ticket was not issued according to regulations and forced a tip from him before he would let him pass. In the train a guard discovered that his ticket was wrongly dated but allowed him to remain on the train for a consideration. The conductor then noticed that the director general was not smoking although he was occupying a smoking compartment so he levied a fine on him. Then upon his arrival at his destination a railway porter stole his suitcase.

Our Congratulations to the Engineman and the Railroad

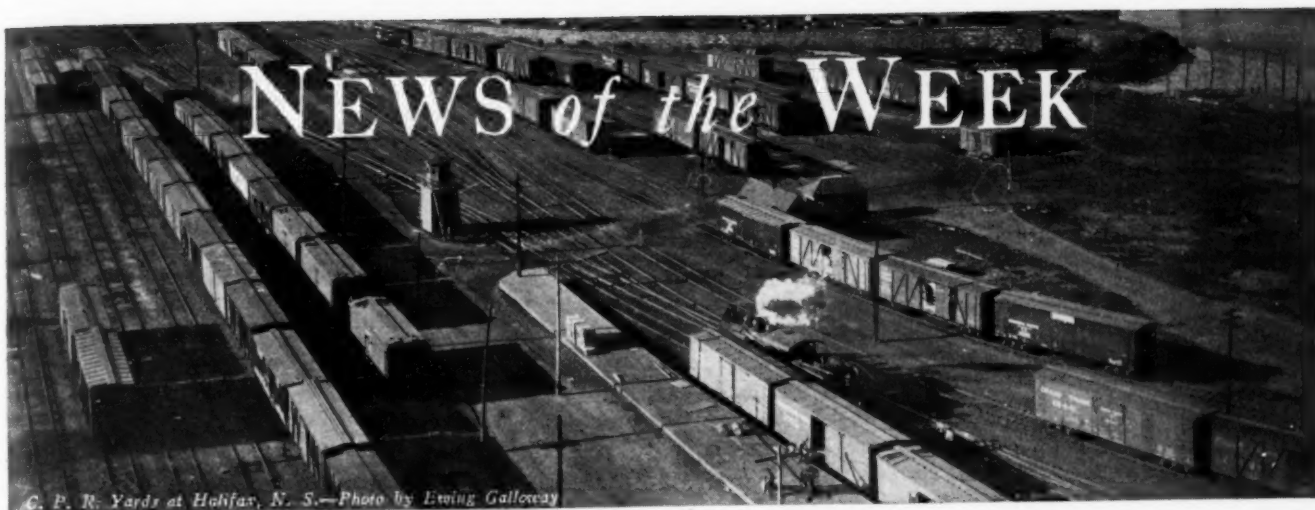
Samuel S. Adams, Elgin, Ill., writes the following account of his ride on the Lackawanna Limited:

"While the train was standing at Water Gap, three of us passengers placed three empty ginger ale bottles outside of the railing on the observation car and on each bottle we placed a penny. We agreed that it was a 50-50 bet that all three bottles would fall off when the train pulled out. But to our surprise the bottles remained in position and the pennies remained on top of the bottles. I left the observation platform as the train approached Newark. At that time the three bottles were in their original positions. One penny had fallen to the roadbed; one penny had fallen to the floor, but the third penny was still on top of the bottle. In other words, for nearly two hours, a penny had ridden on top of an empty ginger ale bottle outside the railing. During this time, the train made several stops, had traveled at the rate of fifty miles an hour around curves, and better than a mile a minute on tangents."

An Unusual Railroad

No salaries are paid to the officers of the Manchester & Oneida, which runs between Manchester, Iowa, and Oneida, 8 miles. This line boasts of a director for every half mile of track. The ownership of shares of stock in the road is regarded as a badge of loyalty to the city. Constructed in 1901 of standard gage, the road operates one mixed freight and passenger train daily and is a great accommodation to the community and eight miles of rural district that it serves. Joseph Hutchinson is the president; E. M. Carr is chairman of the board of directors and was the first president; while C. J. Seeds is auditor and traffic manager. The road has never declared a dividend, and has never paid a salary to any officer; it has never missed paying its interest on its debt; and has never levied an assessment upon the stockholders. It has never had a personal injury claim.

Business men of Manchester paid most of the cost of construction and all of the work was performed by residents of Manchester. Recently a motor bus with flanged wheels was installed which makes numerous trips. Since the motor bus was secured, the road is making a profitable showing for the first time in its career.



C. P. R. Yards at Halifax, N. S.—Photo by Ewing Galloway

HARLEY W. BRUNDIGE, a member of the Railroad Commission of California and former president of the commission, died at Los Angeles, Cal., on July 16.

THE SOUTHERN PACIFIC of Mexico is engaged in the removal of its general offices from Tucson, Ariz., to Guadalajara, Jalisco, following the opening for traffic of the line between Tepic, Jalisco, and La Quemada.

FRED P. WOODRUFF has been appointed as a member of the Iowa Board of Railroad Commissioners, with headquarters at Des Moines, succeeding Dwight Lewis, who has resigned to become commerce counsel of the board.

A JURY in Judge Kickham Scanlan's court on July 14 returned a verdict against the Chicago & North Western for \$30,000 damages in favor of Edward G. Spencer, formerly a brakeman for the railroad. The plaintiff alleged he had fractured his knee, incurring disability, as the result of a collision in the switching yard two years ago,

when a string of empty cars on which he was riding ran into some baggage cars.

ROBERT S. BINKERD, vice chairman of the Committee on Public Relations of the Eastern Railroads, will speak before the Industrial Relations Association of Chicago on August 1, on the subject "Human Relations in Business."

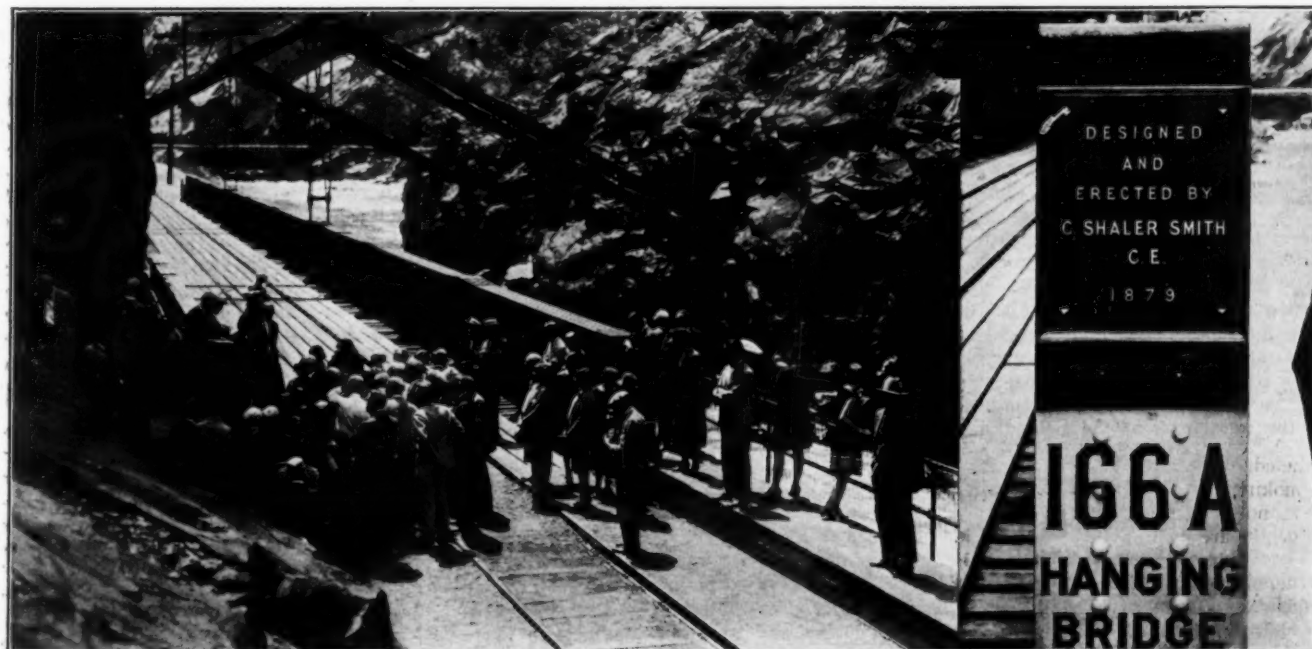
THE INTERSTATE COMMERCE COMMISSION has authorized the Pennsylvania Railroad to change the type of train-stop device installed under the commission's order of June 13, 1922, between Harrisburg, Pa., and Baltimore, Md.

AN INTERNATIONAL Travel Exposition sponsored by the Hotel Sherman, Chicago, will be held at that hotel on November 21 to 26. A panoramic display of the scenic spots of the world, exhibited in relief or reproduced in models, will be featured. Travel will be pictorially exhibited in its relationship to education, culture, commerce and industry by the variety of interests which serve the traveling public. Among

the business interests which have been invited to participate are the railroads, steamship companies, motor and air lines, manufacturers of travel equipment, educational groups and publishers.

D. & R. G. W. Honors Designer of Hanging Bridge in Royal Gorge

A tablet commemorating the design and erection of the hanging bridge over the Arkansas river in the Royal Gorge near Canon City, Colo., by C. Shaler Smith in 1879, was unveiled before a post-convention tour party of the American Society of Civil Engineers on the Denver & Rio Grande Western on July 18. The memorial plate was attached to the end of one of the plate girders, where it may be seen by passengers, since all passenger trains going through the gorge in daylight stop 10 minutes at the bridge. It was presented to the D. & R. G. W. by the six daughters of Mr. Smith, through the so-



Secretary Seabury Presenting Tablet (Shown at Right) to General Manager Shields of the D. & R. G. W.

ciety, of which he was a member. George T. Seabury, secretary of the A. S. C. E., made the presentation address and the tablet was accepted for the railroad by A. C. Shields, general manager.

The Hanging Bridge was conceived by Mr. Smith in 1878, after it was found that ordinary methods of locating the track in that section of the Royal Gorge were not possible. The bridge is located at a point where the canyon was too narrow to afford room for both the roadbed and the waterway, thereby imposing the necessity of supporting the track on a bridge spanning the stream longitudinally rather than transversely. By placing the bridge close to one wall it was possible to support the floor system on that side on a bench wall and one girder span. But on the other side lack of opportunity to introduce any piers pointed to the necessity for a single span of such a length as to complicate the design of the floor system. To avoid this, three girder spans were used, intermediate supports for which were provided by eyebar hangers suspended from two A frames supported from the two sides of the gorge.

Associates of Mr. Smith recall that survey lines for the Hanging Bridge were run with engineers and assistants swinging in mid-air, suspended by ropes from the top of the gorge. Mr. Smith, who died in 1886, is also credited with erecting the first cantilever railway bridge in the world.

New England Railroad Club Outing

The New England Railroad Club with guests and ladies will hold an outing at the Shore Gardens, Nantasket Beach, Mass., on August 9. The party will leave Rowe's Wharf, Boston, at 2:15 p. m. A shore dinner will be served at 6 p. m. and at 8 p. m. the party will leave for a moonlight sail for Boston. Reservations may be made through the secretary of the club, W. E. Cade, Jr., 683 Atlantic avenue, Boston.

Break Ground for P. R. R. Philadelphia Station

The formal ceremony of ground breaking for the Pennsylvania's new terminal improvements at Philadelphia was held on July 28. Mayor Kendrick of Philadelphia in the ceremony used a silver spade appropriately engraved. The improvements involve the removal of the present Broad street station and the elevated structure leading to it; the construction of an underground station near the present Broad street station with a subway approach for suburban trains and the construction of a new passenger station for through service on the west bank of the Schuylkill river.

New York Grade Crossing Decision Upheld

The Court of Appeals of New York has unanimously confirmed the decision of the Appellate Division of the Supreme Court of New York which upheld an order of the New York State Transit Commission ordering the Staten Island Rapid Transit

(a Baltimore & Ohio subsidiary), to eliminate five grade crossings. The decision is looked upon as important, since if the railroad had been sustained in its contention that it was not financially able to undertake the elimination, the comprehensive program which the State of New York has undertaken in grade crossing elimination might have been considerably affected.

Continue Fight on Edgewood Cut-off

The state of Illinois is continuing its efforts to stop the construction of that part of the Edgewood cut-off which lies within that state. This is a line being constructed by the Southern Illinois & Kentucky, a subsidiary of the Illinois Central, from Edgewood, Ill., to Fulton, Ky., crossing the Ohio river at Metropolis, Ill. A suit seeking an injunction to restrain the construction of the line has been appealed to the Supreme Court of the United States by Attorney General Oscar Carlstrom of Illinois. The state courts held that the construction had been authorized by the Interstate Commerce Commission and that they were without jurisdiction to interfere.

C. & N. W. Opposes M. of W. Wage Increase

A lack of funds has resulted in the failure to restore the physical condition of the Chicago & North Western to its pre-war standards, according to C. T. Dike, engineer of maintenance, testifying before an arbitration board considering the demands of maintenance-of-way employees for an increase in wages of five cents an hour. He also said the road had been forced to neglect renewals and necessary maintenance work due to the same cause. Another witness said that wages paid by the North Western were generally higher than those paid by competitors in the west and also higher than those paid by some roads in the southeast.

Further Hearing on Depreciation Order

The Interstate Commerce Commission has reopened for further hearing its orders of November 2, 1926, which directed the railroads and telephone companies to establish a system of depreciation accounting under regulations prescribed in the orders. As to the steam railroads the commission's order says this action is taken "upon consideration of the record in this proceeding and of petitions for rehearing filed on behalf of the New York Central Lines and the Presidents' Conference Committee on Federal Valuation of Railroads in the United States." The further hearing is assigned for November 9 at Washington before Commissioner Eastman and Examiner Bunten. It is ordered that respondent carriers shall file with the commission on or before September 1 a statement setting forth specifically and in detail the matters in regard to which they desire to introduce evidence at the further hearing.

Traffic

The Interstate Commerce Commission has granted a petition of the Postmaster General for a rehearing on its decision allowing certain short line railroads in the intermountain and Pacific coast territories increased rates for the transportation of mail.

The Mississippi-Warrior Service will place 3 tow boats and 15 covered barges in service on the Mississippi river between St. Louis, Mo., and St. Paul, Minn., on August 15. Sailings will be made from each port every five days. By next spring it is planned to increase the number to 5 tow boats and 60 barges.

The Interstate Commerce Commission has issued a modification of its standard time zone order shifting the boundary line between the central and mountain time zones in Kansas, effective on August 7, and authorizing the Atchison, Topeka & Santa Fe to operate from the eastern boundary of Ness county to Scott county under central time.

The Boston & Maine's new fruit and vegetable auction terminal on Rutherford avenue, Boston, Mass., will be opened on August 5 with a luncheon to several hundred persons in the display and distributing shed. The opening of this plant marks the inauguration of the latest unit in the Boston & Maine's new \$5,000,000 Boston terminal improvement project.

Hale Holden, president, and Charles E. Perkins, a director of the Chicago, Burlington & Quincy, and Howard Elliott, chairman of the board of directors of the Northern Pacific, held a conference with President Coolidge at the "Summer White House" near Rapid City, S. D., on July 9, in which they explained the preparations that are being made by their respective railroads for the movement of what they predicted would be a record grain crop.

The Interstate Commerce Commission has announced a reopening for further hearing of the proceeding in which it had authorized the Minneapolis, St. Paul & Sault Ste. Marie, the Great Northern and the Northern Pacific to establish a joint passenger-train service between St. Paul and Minneapolis, Minn., and Duluth, Minn., and Superior, Wis., under a plan for a division of earnings. The case was reopened on application filed by the three roads on July 15.

Tariffs have been filed with the Interstate Commerce Commission, effective on August 10, providing for the reductions in lake cargo coal rates suggested but not ordered by the commission in its lake cargo rate decision from the Fairmont districts and others related to the Pennsylvania and Ohio districts from which the commission ordered reductions of 20 cents a ton. The rate from the Fairmont district is to be reduced 10 cents a ton to \$1.71 and that from the Connellsville and certain other

districts from \$1.66 to \$1.56 a ton. The latter tariffs were filed under sixth section permission on 15 days' notice, while the tariffs from the Pittsburgh and Ohio districts were filed about July 9.

New Train Service for Saratoga Races

A new service between New York City and Saratoga Springs, N. Y., during the running of the Saratoga races has been announced by the New York Central, which, in conjunction with the Delaware & Hudson, will operate a special race train between the two cities on five Saturdays, beginning August 6.

This train, which will give racing enthusiasts five hours in Saratoga in which to attend the day's racing, will leave Grand Central Terminal, New York, each Saturday morning at 8:30, standard time, stopping at 125th street, New York, Yonkers and Poughkeepsie. It will arrive in Saratoga Springs at 1 o'clock, standard time.

Returning, the train will leave Saratoga at 6:10 p. m., standard time, and will arrive in Grand Central Terminal at 10:40. Its equipment on the trips during August will include parlor cars, dining cars and coaches. On the one trip in September only coaches and dining cars will be included.

I. C. C. Asks Data on Rates on Furniture, Fresh Meats and Packing-house Products

The Interstate Commerce Commission has issued a supplemental questionnaire in connection with its rate structure investigation, No. 17,000, calling upon Class I railroads, except switching and terminal companies, to furnish information regarding rates on furniture, fresh meats and packing-house products of more restricted scope than that called for as to nine selected commodities in a questionnaire dated August 30, 1926. The object of the new inquiry is to obtain a list of rates, by territories, with corresponding distances and other information, regarding the commodity under consideration, from representative points of origin through to representative points of destination. The roads are asked to give rates on which a substantial volume of traffic is carried, the number of rates selected from points on various portions of a respondent's line to be as far as possible in proportion to the volume of traffic.

Reductions on Lake Cargo Coal Rates from Southern District Proposed

Reductions of 20 cents per ton in rates on lake cargo coal from the "southern" district fields of West Virginia and Kentucky to the Lake Erie ports, to meet the similar reductions ordered by the Interstate Commerce Commission in its decision of May 9 from the Pennsylvania and Ohio fields, are proposed by railroads serving the southern fields, in spite of the commission's expression of opinion in its decision that the carriers would not be justified in reducing

the present rates from the southern district and that it expected that the carriers would increase the differentials between the northern districts and the southern districts by the amount of the reductions ordered from the former.

The southern roads some time ago announced their intention of reducing their rates by 10 cents a ton to meet an expected reduction of 10 cents in the rate from the Fairmont district, suggested but not ordered by the commission, but following a number of conferences between representatives of the roads and the southern coal operators announcement was made by the Norfolk & Western of its intention of making a 20-cent reduction and a Chesapeake & Ohio tariff making a similar reduction arrived at the commission's offices on July 27, effective August 28. Other tariffs were understood to be on the way but this was the only one actually received.

The C. & O. tariff, on behalf of itself and its connections, proposes a reduction from the Kanawha-Kenova-Thacker districts from \$1.91 to \$1.71 and from the New River-Pocahontas districts from \$2.06 to \$1.86 a ton.

Grain Rate Hearing Resumed at Wichita

Representatives of the Interstate Commerce Commission conducting the hearing on the investigation of rates on grain and grain products which was resumed at Wichita, Kan., on July 11, were requested by Clyde M. Reed, formerly chairman of the Kansas Public Service Commission, to issue a subpoena following the refusal of K. A. McConnell, Wichita credit manager of the Standard Oil Company, which operates 204 service stations in that territory, to testify as to credit conditions of farmer customers and their ability to settle their charge accounts. In only a few instances in the past has a subpoena been served by the commission and then only after all other persuasive powers had failed. Such a process is served by the United States marshal and failure to appear results in contempt proceedings in the federal court.

Governor Henry S. Johnston of Oklahoma testified that freight rates should be adjusted to the earning power of the industries served by the railroads, and that agricultural and transportation are at too wide a variance in proportioning earnings on their respective investments. Rates on farm products, he said, should be based on such a charge that would pay to the carrier the cost of transportation and not to exceed 3½ per cent on the railroad investment necessary in the business of transporting those products. He also testified on the financial depression of agriculture in Oklahoma, saying that now only 56.7 per cent of the wheat belt farms are owned by present occupants, and earnings last year on the average farm equity of \$6,000 on the farms thus owned was 3½ per cent.

Walter R. Scott, transportation commissioner of the Kansas City Board of Trade, presented exhibits which included a study of where grain is grown, statistical data and charts dealing with the method of marketing grain and grain products and a study

of the general grain rate structure showing how the rate system has grown up and adapted itself to the actual movement of grain.

Representatives of the Interstate Commerce Commission conducting the hearing made a trip to nearby wheat fields to inspect farm conditions and examine the facilities for getting grain to market. J. H. Rauhan, representing the New Orleans Joint Traffic Bureau, proposed proportional rates from Missouri river and Mississippi river points to points in Arkansas and Louisiana and also proportional rates from Ohio river and Mississippi river points to the Mississippi river valley and the southwest.

L. V. Beatty, assistant general freight agent of the Kansas City Southern, said that wheat in the southwest is bought on the Kansas City basis, less freight rates and therefore the rates should break on that market. That is the only fair way, he said, in which the farmer can obtain the market price for his grain and allow grain and grain products to move out of that market on an equitable basis. He stated that the rates from Kansas to Louisiana should be based on the rates into Kansas City, plus the proportional rate out of that market.

Rail Shipments of Watermelons in 1926

Rail shipments of watermelons in 1926 were the greatest for any year on record, according to a special study just completed by the Bureau of Railway Economics of the production and distribution of watermelons. The reports show 54,705 carloads of watermelons shipped by rail in 1926 from producing areas to consuming markets. This was an increase of 7,080 cars, or approximately 15 per cent, over the previous high record of 1922. Total watermelon production in 1922, however, exceeded that in 1926 by 2¼ per cent.

"Rail shipments," according to the report of the study, "have increased at a greater proportionate rate than either acreage or production, namely from an average of 29,522 cars in 1918-1920 to an average of 48,211 cars in 1924-1926, an increase of 18,689 cars, or 63.3 per cent. This relatively greater increase in rail shipments as compared with the increases in acreage and production indicates that the growers are now shipping a greater part of their crop by rail than they did in former years. This is further borne out by a comparison of that proportion of the crop shipments by rail in each of the periods. In 1918-1920, the average portion shipped by rail was 68 per cent of the total average production while in 1924-1926 the average proportion shipped by rail had increased to 79 per cent.

"Prices of watermelons paid to the grower and in the wholesale and retail markets showed a wide range during the 1926 season, fluctuating widely from week to week throughout the season. In view of the fact that freight rates remained stationary throughout the season, the ever changing price situation was not due to that cause but was governed by other factors such as supply, demand, quality and

weather conditions. The stability of the freight rate structure is indicated by the fact that of the 566 rates studied, not one was changed during the season.

"Wide variations in prices paid to the growers for watermelons occurred between shipping points having practically the same freight rates to markets while wholesale prices were sometimes higher on the same day at markets to which lower freight rates were in effect than at those having higher rates."

Advisory Boards Estimate Increased Traffic for Third Quarter

Reports received by the Car Service Division of the American Railway Association from the thirteen Shippers Regional Advisory Boards, which now cover the entire United States, estimate the transportation requirements for 27 of the principal commodities for the third quarter this year (July, August and September) at approximately 416,197 cars in excess of the loading for the same period last year, or an increase of 4.3 per cent. On the basis of the reports, the Car Service Division estimates that 9,992,580 freight cars will be required to handle those commodities in the third quarter compared with 9,576,383 cars for the same months in 1926.

Of the thirteen boards, only two, the Southwestern and the Pacific Northwest boards, estimated a decrease in business for the third quarter, increases being estimated by all other boards, ranging from three-tenths of one per cent in both the New England and the Northwestern regions to 11.7 per cent in the Central Western. The territories covered by the boards correspond roughly with those of the federal reserve banks.

The estimates by the boards, as to freight loadings for the principal commodities by cars for the third quarter in 1927, as compared with those of the corresponding period last year and the per cent of increase or decrease are as follows:

Board	1926	1927	Per Cent of Increase or Decrease
New England	164,800	165,225	.3
Middle Atlantic States	1,206,106	1,246,920	3.4
Allegheny	1,310,306	1,457,112	11.2
Great Lakes	845,767	851,733	.7
Southeastern	1,093,246	1,198,814	9.7
Ohio Valley	1,161,273	1,222,430	5.3
Middle-Western	972,247	1,004,345	3.3
Northwestern	443,114	444,643	.3
Trans-Missouri-Kansas	583,444	593,921	1.8
Central-Western ..	318,136	355,300	11.7
Pacific Coast	448,139	457,255	2.0
Southwestern	722,727	710,097	1.7
Pacific Northwest.	307,078	284,785	7.6

In submitting reports to the Car Service Division, each board estimated what freight car requirements would be for each of the principal industries to be found in its territory. The reports indicated heavier movements of commodities from 27 different industries with the exception of grains, livestock, fresh fruits other than citrus fruits; sugar, syrup, glucose and molasses; iron and steel and castings and machinery.

The estimates for various commodities

for the third quarter as compared with the same period last year are as follows:

Commodity	Percentage	
	Increase	Decrease
All grain .....	...	1.6
Flour meal and other mill products	2.6	..
Hay, straw and Alfalfa.....	2.9	..
Cotton (Includes cotton seed and products except oil)...	24.5	..
Citrus fruits	14.1	..
Other fresh fruits.....	...	4.1
Potatoes	6.7	..
Other fresh vegetables.....	9.3	..
Live Stock .....	...	1.9
Coal and Coke.....	7.1	..
Ore and Concentrates.....	1.4	..
Clay, gravel, sand and stone.	8.4	..
Lumber and forest products..	1.2	..
Petroleum and petroleum products	9.7	..
Sugar, Syrup, Glucose and Molasses .....	...	.8
Iron and steel.....	...	5.0
Castings and machinery.....	...	1.8

Maritimes Complain That 20 Per Cent Rate Reduction Not Fully Effective

Complaints from shippers in the Maritime provinces to the effect that the Canadian National was not fully meeting the provisions of the legislation at the last session of Parliament to give the Maritime provinces a 20 per cent reduction in freight rates resulted last week in two orders being issued by the Dominion Railway Board and also in a statement being issued at Moncton, New Brunswick, by M. F. Tompkins, traffic manager of the Atlantic region of the Canadian National, who denied that the railway with which he is connected was attempting to defy the legislation of Parliament.

The Maritime Freight Rate Act was to become effective on July 1, but according to the charges of shippers in the Maritime Provinces, and according to the tariffs filed with the Dominion Railway Board by the Canadian National, the legislation is not yet effective. All of the other railways affected by the act, including the Canadian Pacific, the Quebec & Oriental and the Kent Northern have filed tariffs in accordance with the act.

From the tariffs filed by the Canadian National there appears an average discrepancy of about two cents per 100 lb. between the rates required by the act calling for a twenty per cent reduction, and the rates sought to be made effective by the Canadian National. It is also charged by maritime shippers that according to the Canadian National tariffs that railway made no provision for routing via St. John, N. B., or via Ste. Rosalie Jct., the junction point 70 miles east of Montreal, where the main line of the Canadian National from the Maritimes first touches the Canadian Pacific eastbound. This, shippers charged, had the effect of isolating St. John as far as shippers were concerned, and also of making it practically impossible for shippers originating freight in the Maritimes on the Canadian National and having their consignments transferred to the Canadian Pacific at Ste. Rosalie or Montreal for points in western Canada.

As a result of these complaints the Dominion Railway Board has issued an order signed by Chief Commissioner H. A. McKeown, deputy chief. Commissioner Thomas Vien and Commissioner A. C. Boyce, directing "that the Canadian National Railways do forthwith publish tar-

iffs of through rates via St. John and Ste. Rosalie from points in the Maritime Provinces to stations in Canada beyond eastern lines, said through rates to be the rates in existence between such points on June 4, 1927, less approximately twenty per cent as provided in Section 3 of the Maritime Freight Rates Act."

Following is the statement in part issued by Mr. Tompkins of the Canadian National:

"Some portion of the press in the Maritime Provinces is trying to create the impression that the Canadian National Railways are endeavoring to avoid granting the full reductions authorized under the act.

"Immediately after the act was passed by Parliament the Canadian National Railways undertook to implement it not only so far as their own territory is concerned, but they made appointments and held conferences with the connecting railways throughout the territory for the purpose of assisting these connecting railways in adjusting joint tariffs—this notwithstanding that such adjustment rested with these connecting railways.

"The act provides that an approximate 20 per cent reduction will be made in the local rates within the preferred territory, and also an approximate 20 per cent reduction in the eastern territory proportion for the westbound rates in Canada for points beyond Diamond Junction and Levis, Que.

"It is obvious that a person would have to draw on his imagination to figure that this regulation would be applicable on traffic moving westbound from Canadian National territory via St. John and the Canadian Pacific, as such traffic would not pass through Levis or Diamond Junction, and consequently there is no means of measuring the eastern proportion from which to deduct 20 per cent.

"In the case of traffic originating within the Maritime provinces and moving west over the Canadian National Railways through Diamond Junction or Levis, routed via Ste. Rosalie and the Canadian Pacific, it is first necessary to deduct the existing C. P. R. proportion, as the act does not provide any reimbursement for that company, or for any other railway for any regulations that may take place in their proportion west of Levis or Diamond Junction. Therefore, the only amount that can be reduced is a division of the balance of the rate accruing to the Canadian National Railways east of Ste. Rosalie Junction being divided on Diamond Junction, mileage, which would be a less proportion than would accrue on traffic moving to its final destination over the Canadian National Railways, and it is on this account that a higher rate had to be published via Ste. Rosalie Junction and Canadian Pacific than via Canadian National direct.

"The alleged disadvantage has been taken care of by the Canadian National Railways by their undertaking to absorb at common points the Canadian Pacific inter-switching charges when the consignees desire deliveries on the tracks of that company.

"So as to give the shippers the fullest possible advantage under the act the Canadian National Railways used in the case of non-competitive points the nearest Canadian Pacific junction to final destination."

Foreign Railways

France Celebrates Railway Centenary

The centenary of the first railway in France, that from Saint-Etienne to Andrieux, was celebrated at Saint-Etienne on June 12. Andre Tardieu, Minister of Public Works of France, took part in the ceremony, an important feature of which was the unveiling of the bust of Marc Seguin, a pioneer in the development of the steam locomotive. Another feature of the celebration was a procession of vehicles representing various periods in the development of transportation.

"Eight Trains in Search of a Name"

The German Railway Company has started a prize contest for the most striking names for important express passenger trains between Berlin and Frankfurt, Hamburg, Cologne and Munich. Heretofore there has been very little naming of trains in Germany. The English railways likewise are naming additional trains with the appearance of the summer schedules. On the London, Midland & Scottish, for instance, there will be the "Royal Scot," the "Welshman," the "Ulster Express," and others. Incidentally this road will have a non-stop run of 236¼ miles from Euston station (London) to Carnforth, which record will be improved upon by the London & Northeastern's "Flying Scotsman" which will run non-stop from Kings Cross station (London) to Newcastle, 268 miles.

Through Service from Bagdad to Aleppo

A step toward realizing the railway possibilities of Aleppo in the north of Syria has lately been taken in the opening of an express service to it over the old Bagdad railway line from Constantinople. The old Bagdad line, potentially the shortest rail route between Western Europe and India, connects there with the French-owned railways which run south through Syria to link with the British railways of Palestine, Egypt and the Sudan, a chain of lines which is potentially the likeliest rail route between Europe and South Africa. These potential routes connecting three continents by rail, pivot on Aleppo.

The International Sleeping Car Company which began the new service on July 2, has announced it as the first installment of an eventual service to Bagdad. At present the old Bagdad line extends only to Nisibin in Upper Iraq. Beyond Aleppo, local trains run to the desert stations which lie toward Nisibin. Up from Bagdad the line has been pushed to Shergat below Mosul, but the gap between Nisibin and Shergat has never been filled in.

From Aleppo the French railways afford direct connection with Damascus, where a rack-rail line drops down through the

Lebanon to Beirut on the coast. From Damascus also the narrow-gage Hejaz line runs to Ed-Deraoh and thence to Haifa on the coast, whence the British-owned standard gage lines run south to Jerusalem, Cairo and Khartoum. What the Sleeping Car Company has now done is to open a through service twice a week between Constantinople and Aleppo.

Swiss Roads in 1926

The results of operating the Swiss railways during 1926 have fallen short of expectations, and the earnings, not only of the Federal Railways, but also of the great majority of private lines, show a further setback as compared with 1925, and especially with 1924. In 1926 the gross revenue of the State Railways amounted to about \$15,000,000 and expenditure to about \$10,000,000, leaving a gross surplus of \$5,000,000. The financial requirements of the Federal railways in 1926, including the service and amortization of their debt and war losses, exceeded this gross surplus by about one half a million dollars, representing a net loss, as compared with a net profit of about \$400,000 in 1925. This loss is attributable partly to a decrease of about \$800,000 in passenger traffic earnings, and partly to another of \$2,800,000 in freight receipts, due to the application of lower rates to cope with the competition of motor transport.

In 1926 the Federal Railways earned 2.6 per cent less than in 1925, the narrow-gage lines 4.2 per cent less, the private standard gage railways 2.7 per cent, rack railways 11.8 per cent, and funicular railways 3.6 per cent less. The percentage deficit on all railways was 2.5 per cent.

Bolivian Railway Made Government Property

The Bolivian Railway was taken possession of by the Bolivian Government in a decree issued by the President and Cabinet under date of June 29, according to advices received in the Department of Commerce.

Seizure of the railroad was actuated, it is believed in Bolivia, by the suspicion which is said to have arisen that creditors who had advanced large sums to the road intended to throw it into the hands of a receiver. The chief contract of the railway with the government expired last December.

The President and Cabinet, citing laws which are said authorize the Executive and Cabinet to take such action, assert in the decree that the step was taken to protect the national welfare and the present holdings of the government in the railroad, which are estimated in Bolivia to be one-third of the whole system.

The entire system of the Bolivian Railway, comprising 570 miles of road, rolling stock, shops and other equipment, is now government property.

Argentina to Build Three New Railway Lines

The construction of three railway lines is contemplated in Argentina, calling for an expenditure of 39,100,000 paper pesos over the next three years, according to advices from Commercial Attache Alexander V. Dye, Buenos Aires, made public by the Department of Commerce.

The most northern line is a completion of the railway which runs through Formosa and is now finished as far as Las Lomitas (from M. P. 93 to Embaracion, M. P. 252). This work is to be completed within 18 months from the time of signing the construction contract.

The second line runs from Avia Terai to El Quebrachal, a stretch of 226 miles. The third line contemplated is between the city of Cordoba and La Puerta and is in the nature of a cut-off. These are all metre-gage roads. As soon as the Secretary of Public Works shall have passed on the matter they will be opened to public bids.

Further information relative to this project is available from the Department of Commerce.

German Company Contracts to Build Two Turkish Railroads

A German general contracting company has contracted with the Turkish Government for the construction of two new railroad lines, says a report to the Department of Commerce from Assistant Trade Commissioner Lee C. Morse, Berlin. One of the lines will run north and south, connecting the towns of Boghaz-Keui (in the lead-mine region just west of the Ala Daghi, in the Negdah Province of southern Anatolia) and Ulu-Kishla (on the Bagdad Railway some 25 miles west of Eregeli, which is on the southeast border of Konia Province).

The second line will run northwest from Kutahia (the present terminus of a spur from the Anatolian Railway in the Province of Kutahia) to the village of Tavshanli, on the way to the rich chrome fields of Chardi. The first line is to be finished within three and one-half years; the second within three years.

The terms of the contract call for the payment of 65,000,000 reichsmarks (\$15,500,000) to the company within four years. Part of the amount is to be paid in cash on signing the contract and the rest in monthly installments. The Turkish government, it is reported, will finance the undertaking by borrowing the necessary funds from a German banking syndicate headed by the Orient Bank of Berlin. The bankers will receive debenture bonds maturing in eight years and bearing 10 per cent interest. On this basis Turkey will pay a total of 81,000,000 reichsmarks (\$19,300,000) including principal and interest.

The German government, in order to improve commercial relations with Turkey, has deposited with the bankers 30,000,000 reichsmarks, equal to almost 50 per cent of the contract price, to serve as a guaranty. The Turkish government agrees to purchase from Germany all rails, rolling stock and other materials and equipment for the two lines.

Equipment and Supplies

Freight Cars

THE WESTERN MARYLAND has ordered two extension side dump cars, from the Clark Car Company.

THE CORN PRODUCTS COMPANY, Pekin, Ill., has ordered one extension side dump car from the Clark Car Company.

THE UNITED STATES CAST IRON PIPE & FOUNDRY COMPANY has ordered one extension side dump car from the Clark Car Company.

THE JOHNSON MINING COMPANY, Thetford Mines, Quebec, has ordered two 21-cu. yd. air dump cars, from the Clark Car Company.

THE MICHIGAN CENTRAL has ordered one plow car from the Rodger Ballast Car Company. This is in addition to those reported in the *Railway Age* of July 23.

THE FRUIT GROWERS EXPRESS has ordered 325 refrigerator car underframes from the Ryan Car Company. Inquiry for 300 steel underframes was reported in the *Railway Age* of July 2.

Passenger Cars

THE DELAWARE & HUDSON is inquiring for eight baggage and mail cars.

THE NEW YORK, NEW HAVEN & HARTFORD is reported to have ordered 15 baggage car underframes from the Standard Steel Car Company. Inquiry for 15 steel underframes for baggage cars was reported in the *Railway Age* of July 2.

Iron and Steel

THE READING is in the market for 300 tons of steel for a bridge.

THE SOUTHERN is in the market for 225 tons of steel for a bridge on its line in Georgia.

THE ST. LOUIS-SAN FRANCISCO is inquiring for 650 tons of structural steel for bridge work.

THE LEHIGH VALLEY is inquiring for 200 tons of steel for a bridge on its line at Bethlehem, Pa.

THE CHESAPEAKE & OHIO has ordered 1,200 tons of steel from the Fort Pitt Bridge Company.

THE PENNSYLVANIA is inquiring for 425 tons of steel for a new passenger station at Lancaster, Pa.

THE BALTIMORE & OHIO has given an order for 350 tons of steel for a bridge in Indiana to the American Bridge Company.

THE NEW YORK CENTRAL has ordered 200 tons of steel from local parties for a power house at Buffalo, N. Y.

THE PENNSYLVANIA is in the market for 150 tons of steel for a bridge to be built on its line at Pittsburgh, Pa.

THE SOUTHERN has ordered 37,675 tons of steel rail from the Tennessee Coal & Iron Company and 650 tons from the Illinois Steel Company.

THE NORTHERN PACIFIC is reported to have ordered 15,000 tons of rail from the Illinois Steel Company and 10,000 tons from the Bethlehem Steel Company.

THE NEW YORK, NEW HAVEN & HARTFORD has bought a boiler house at Boston, Mass., from the Boston Bridge Company, involving the purchase of 350 tons of steel.

Miscellaneous

THE ROYAL STATE RAILWAYS OF SIAM will receive bids at the office of the Administration of the Royal State Railways of Siam, Bangkok, Siam, until 14 o'clock on October 15, 1927, for the supply of superstructures for steel railway bridges. Specifications, drawings, etc., may be obtained from C. P. Sandberg, 100 Broadway, New York, upon payment of \$6 a set.

Signaling

THE SOUTHERN PACIFIC has placed an order with the General Railway Signal Company covering materials for an electric interlocking plant at Santa Clara, Cal. This order includes one 48-lever Model 2 unit type electric interlocking machine, having 34 working levers and 14 spare spaces, one operating switchboard, 8 Model 4A switch machines, 4 Model 5A, 110-volt, D-C. switch machines and eight 3-position type "S" color light signals.

THE PERE MARQUETTE has placed contract with the General Railway Signal Company covering electric interlocking materials for plant at Holley, Mich. The order includes one 6-way desk type circuit controller, two units being for the operation of 12 signals and four units for the operation of five switches. There will also be five 110-volt d.c. electric switch machines, 137 relays of various resistances, 15 switch circuit controllers, four 3-indication color light triangular type signals and four 2-arm, 3-indication color light triangular type signals.

THE DESTRUCTION BY FIRE of a trestle near Crescent, B. C., on the line of the Great Northern between Bellingham, Wash., and Vancouver, B. C., on July 4 forced the detouring of trains over another route from July 4 to 6.

ELEVEN ELECTRIC TRAINS, designed each to be driven and conducted by one man, have been built in Switzerland, according to Modern Transport (London), and will be placed in operation on the Swiss Federal Railways this summer.

Supply Trade

The Mississippi Valley Structural Steel Company will construct a two-story factory at Melrose Park, Ill.

The Harnischfeger Corporation, Milwaukee, Wis., has opened a branch office at 330 Gateway Bank building, Minneapolis, Minn.

Reno V. Jones, representative of the Trumbull Steel Company, has been placed in charge of the newly opened office at Rochester, N. Y.

The American Rolling Mill Company, Middletown, Ohio, has purchased the Columbia Steel Company and the Forged Steel Wheel Company of Pittsburgh, Pa., subsidiaries of the Standard Steel Car Company.

Walter C. Carroll, vice-president of the Inland Steel Company, Chicago, will resign effective August 1, to become president of the National Association of Sheet and Tin Plate Manufacturers, with headquarters at Pittsburgh Pa.

The Ingot Iron Railway Products Company, Middletown, Ohio, has moved its district offices from 1236 Peoples Gas building, Chicago, to its new plant at 6559 South Lorel avenue. The St. Louis district office has been moved from the Boatmen's Bank building to 901 Ambassador building.

William M. Horsell, sales representative of the J. G. Brill Company in the central states covered by the G. C. Kuhlman Car Company, has been transferred to its Philadelphia plant to represent the company's electric railway division in the southeastern territory, including Virginia, North Carolina, South Carolina, Georgia and Florida.

The Lincoln Electric Company, Cleveland, Ohio, has moved its Missouri district office from 1808 Railway Exchange building, St. Louis, to 1003 Davidson building, Kansas City, in charge of Robert Notvest. A branch office has also been established at 220 Nicholas building, Toledo, Ohio, with A. H. Homrighaus, formerly of the Missouri district, in charge.

W. F. Hosford has been appointed comptroller of manufacture of the Western Electric Company, with headquarters at New York City, succeeding James W. Bancker, elected a director of the company and vice-president in charge of purchases and traffic. David Levinger succeeds Mr. Hosford as engineer of manufacture, and J. R. Shea is appointed superintendent of manufacturing development, both with headquarters in Chicago.

American Locomotive Company

The American Locomotive Company reports earnings for the six months ended June 30, 1927, of \$2,485,784 equivalent

after allowance for the half year's dividends, to \$1.48 a share on no-par common stock. Net profits in the first six months of 1926 were \$3,338,289 or \$3.10 a share. The company pays \$8 a share annually on its common stock. F. F. Fitzpatrick, president, says in the report:

The business of the Railway Steel-Spring Company, acquired during 1926, has been consistently good and their earnings during the six months were better than for the same period of last year, but the production of locomotives was only about one-half of what it was for the first six months of 1926. However, the company had on July first sufficient locomotive orders to assure much better earnings for the last half of the year than for the first six months' period.

On June 30, 1927, the company had in its treasury \$31,499,021 in cash and marketable securities as compared with \$32,794,330 on December 31, 1926.

The condensed income account of the company and its subsidiaries for the half year follows:

Net earnings from all sources:	
After deducting manufacturing, maintenance and administrative expenses.	\$3,553,884
Depreciation on plants and equipment	855,260
	\$2,698,625
Accrual for Federal taxes.....	212,840
Available profit for the six months	\$2,485,785

June Locomotive Shipments

June shipments of railroad locomotives, from principal manufacturing plants, based on reports received by the Department of Commerce, totaled 89, as compared with 109 in May and 159 in June, 1926. The following table gives the shipments and unfilled orders with comparisons:

Year and Month	Shipments					Unfilled orders, end of month				
	Total	Domestic		Foreign		Total	Domestic		Foreign	
		Steam	Electric	Steam	Electric		Steam	Electric	Steam	Electric
June 1926	159	133	11	12	3	667	522	53	72	20
Total (6 mos.)	901	698	81	89	33	...	...	..	..	..
Total (Year) 1927	1,755	1,352	177	167	59	...	...	..	..	..
January	57	16	8	31	2	405	334	16	49	6
February	80	69	10	..	1	396	314	22	51	9
March	137	84	11	42	..	385	301	48	27	9
April	98	72	23	3	..	327	255	35	27	10
May	109	77	15	13	4	427	380	27	7	13
June	89	63	18	8	..	393	333	24	26	10
Total (6 mos.)	570	381	85	97	7	...	...	..	..	..

* Revised.

Trade Publications

ELECTRIC HEATERS FOR RAILWAY CARS.—The Gold Car Heating & Lighting Company, 220 Thirty-sixth street, Brooklyn, N. Y., describes its study and research on enclosed types of heating elements in its 64-page catalogue on the subject of electric heating for railway cars. Electric heaters with both open coil and enclosed types of heating elements are embraced in this catalogue.

HORTON STEEL TANKS.—The Chicago Bridge & Iron Works has issued a new catalog illustrating and describing its line of tanks, particularly the conical-bottom tank, for use in water service, water treatment, etc. It is profusely illustrated with photographs of railway installations of these tanks. Among other features covered in the text is a

demonstration of the advantages of the conical bottom for tanks from the standpoint of settlement, sludge removal and cleaning.

LONG PIPE LINES WITH OXWELDED JOINTS.—In a booklet of 32 pages, the Linde Air Products Company presents an exposition on the construction of pipe lines with welded joints. Each page is illustrated with a photograph portraying some installation of a welded joint pipe line or some phase of the process of making the welds. In addition to this there is a pertinent paragraph relating to the subject together with a quotation from some authority on pipe lines or welding having particular application to the subject in hand.

MORTON APPLIANCES.—The line of railway appliances and industrial steel products made by the Morton Manufacturing Company, Chicago, is illustrated in a concise yet comprehensive manner in a highly attractive 9½-in. by 11½-in. general insert catalog recently issued. The various products include such items as safety treads, car doors, furnishings, flooring, buffing mechanisms, diaphragms, window curtains and fixtures, steel moldings, etc., all being carefully indexed for the convenience of those who wish to locate readily the exact catalog position of any of the items. The catalog may be kept up to date by the insertion of new or revised sheets as issued and should prove of real assistance to those responsible

Construction

ATCHISON, TOPEKA & SANTA FE.—Bids are being received for the construction of a coaling station of 1,000-ton capacity at Emporia, Kan. This station will have sand handling facilities of 1,500-cu. yd. capacity.

ATCHISON, TOPEKA & SANTA FE.—A contract for the enlargement of the yards at San Angelo, Tex., which will approximately double their capacity, has been let to the Griffith Construction Company, Ft. Worth, Tex.

BUFFALO, ROCHESTER & PITTSBURGH.—The New York Public Service Commission has ordered the elimination of the LeRoy-Warsaw road grade crossing on the tracks of this company near Pearl Creek station, New York, by the diversion of traffic over the new highway which will be constructed at an estimated cost of about \$10,000.

CANADIAN PACIFIC.—Bids have been closed for the dismantling of wooden grain elevators "A" and "B" at Fort William, Ont., preparatory to improvement of the port facilities at that point.

CENTRAL OF NEW JERSEY.—This road has awarded a contract for grading in connection with the widening of its road-bed west of the Bethlehem engine terminal and near the relocating of the public highway adjacent thereto, to F. H. Clement & Company, at a cost of about \$55,000.

CHICAGO, MILWAUKEE & ST. PAUL.—A contract has been let to the M. E. White Company, Chicago, for the construction of reinforced concrete highway subways at Center and at Clark streets, Milwaukee, Wis. This is the first construction in connection with this company's program of track elevation at Milwaukee, which was authorized late in 1926.

CHICAGO & NORTH WESTERN.—An agreement has been reached between this company and the committee on track elevation of the Chicago city council for the construction of three highway subways under the tracks at Peterson and Rogers avenues, Chicago. The cost of the project is estimated at \$375,000, about \$108,000 of which will be paid by the city.

CHICAGO, ROCK ISLAND & PACIFIC.—Plans have been prepared for the construction of a reinforced concrete and steel bridge, 2,400 ft. long, over the Canadian river near Fritch, Tex., the floor of which will be 152 ft. above water level. The cost of the entire structure is estimated at \$1,000,000.

DELAWARE & HUDSON.—The New York Public Service Commission has ordered the elimination of three grade crossings of highways by the line of this company in Cobleskill, N. Y., by closing the crossings and diverting traffic to a new highway, at an estimated cost of \$55,900.

ERIE.—This road plans to let a contract shortly for the elimination of grade crossings on its line at Jamestown, N. Y.

for the selection of railway and car equipment.

WELL SYSTEMS AND WELL PUMPS.—Layne & Bowler, Inc., Memphis, Tenn., has issued a new catalog in loose leaf form with sheets 8 by 10½ in., which illustrates and describes the equipment and service of that company in the water supply field. Of particular interest is the form of construction contract advocated by the company, under which compensation is contingent entirely upon the actual delivery of water from any source of supply it undertakes to develop. Other portions of the catalog are devoted to illustrations and descriptions of the Layne & Bowler gravel wall well, well screens, centrifugal pumps and pump heads, while a number of pages are devoted to illustrations of actual installations.

ILLINOIS CENTRAL.—Bids closed on June 22 for the re-building of the water treating plant at Denison, Iowa.

LEHIGH VALLEY.—This company plans a 200-ton steel bridge on its line at Bethlehem, Pa.

LEHIGH VALLEY.—This road has let a contract to Henry Steers & Company, of New York, for the construction of abutments and concrete piers in connection with the construction of the Lehigh Valley-Pennsylvania bridge over Newark Bay.

LONG ISLAND.—The Public Service Commission of New York has ordered the elimination of the grade crossing of Broad Hollow road, Babylon, L. I., with the line of this railroad. The highway will be carried over the railroad on a bridge.

LONG ISLAND.—The Public Service Commission of New York has ordered the elimination of the St. James and Nissequogue roads grade crossings on the Wading River branch of this company near Smithtown, L. I. An underpass will be constructed carrying St. James road under the railway and the Nissequogue road will be closed and its traffic diverted through the St. James underpass.

MADERA SUGAR PINE COMPANY.—A contract for the construction of a logging railroad in Mariposa County, Cal., 20 miles in length, has been let to A. J. and J. L. Fairbanks, South San Francisco, Cal.

MINNEAPOLIS, NORTHFIELD & SOUTHERN.—An application by this company for the construction of a bridge over the Minnesota river one-half mile north of Savage, Minn., near Minneapolis, has been approved by the War Department.

MISSOURI PACIFIC.—A contract has been let to the Foundation Company of Missouri, Kansas City, Mo., for the construction of a water station and water treating plant at Hermann, Mo., involving the construction of a steel storage tank, a chemical house, pipe lines and a concrete pump pit and the installation of pumping and chemical machinery.

MORRISSEY, FERNIE & MICHEL.—This company plans the reconstruction of its shops at Fernie, B. C., which were destroyed by fire on July 3 with a total damage of about \$50,000.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—This road has begun work on a new tunnel 50 ft. north of its old tunnel at Tunnel Hill, Ga. The new tunnel has been made necessary by the larger equipment now in use.

NEW YORK CENTRAL.—This road has let a contract to the Walsh Construction Company for the construction, at Buffalo, N. Y., of a baggage sub-station, passenger station and garage. Total cost of work involved in this contract is around \$3,000,000.

NEW YORK CENTRAL.—The Public Service Commission of New York has ordered the elimination of a grade crossing at Crockett's Station, N. Y., with the tracks of this company by the closing of the highway which crosses the tracks and the di-

version of traffic to a new highway which will be built at an estimated cost of \$46,000.

NEW YORK CENTRAL.—The New York Public Service Commission has ordered the elimination of the Main street grade crossing on the tracks of this company in New Castle, N. Y., by carrying a highway over the tracks on the bridge. The Commission has also ordered the elimination of the old Forge-McKeever crossing at Thendara, N. Y., by the construction of an underpass for the highway.

NEW YORK, ONTARIO & WESTERN.—The Public Service Commission of New York has ordered the elimination of two grade crossings on the Deposit-Rock Rift highway with this company's line in Walton, N. Y., and Tompkins. The elimination will be accomplished by closing the existing road and building a new one which does not cross the railway tracks.

NORTHERN PACIFIC.—This company contemplates the construction of an addition 100 ft. in length to its pier at Seattle, Wash., involving an estimated expenditure of \$150,000.

PENNSYLVANIA.—This road plans to build a 150-ton steel bridge on its line at Pittsburgh, Pa.

PENNSYLVANIA.—The Pennsylvania has awarded a contract to Stevens-Alquist Inc., of Hackensack, N. J., for the construction of a signal tower and breaker-house at Jersey City, N. J.

PENNSYLVANIA.—A contract has been let to the T. J. Foley Company, of Pittsburgh, for the reconstruction of a bridge over Henry street at Wooster, O., to cost \$30,000. The W. J. Newman Company, of Chicago, has been awarded a contract for masonry work in connection with the separation of the grades of the street and the tracks of the Pennsylvania, the C. C. C. & St. L., the B. & O. C. T., and the C. R. I. & P., at West 47th street, all in Chicago, at a cost of \$30,000. A contract has also been let to the T. J. Foley Company for the reconstruction of another bridge over Little Beaver river at New Galilee, Pa., at an estimated cost of \$35,000. Another contract has been awarded to Allen N. Spooner & Co., Inc., of New York, for repairs to pier No. 27 in the North river, New York, at a cost of \$40,000. The T. J. Foley Company has been awarded another contract for the extension of stalls and pits and the construction of a pit for an electric drop table in a roundhouse at West Morrisville, Pa., to cost \$41,000. The Dravo Contracting Company, of Pittsburgh, has been given a contract for the construction of a double-track concrete trestle at the west approach to the new Wabash river bridge at Terra Haute, Ind., at a cost of \$75,000. A contract has been let to the Mellon Construction Company of Pittsburgh for grading and track work for the west approach of the new Wabash river bridge at Terra Haute, at a cost of \$100,000.

SOUTHERN.—This road will build a 225-ton steel bridge on its line in Georgia.

TULSA, WEWOKA & SOUTHERN.—This company has applied to the Interstate Commerce Commission for a certificate for the construction of a line of approximately 220 miles, between Tulsa and Ardmore, Okla., passing through or near Okemah, Wewoka and Ada. S. S. Orwig, of Wewoka, is president.

UNION PACIFIC.—Preliminary surveys have been made by this company for the construction of a line between Gering, Neb., and some point on the main line between Cheyenne, Wyo., and Julesburg, Colo., about 52 miles.

WACO, BEAUMONT, TRINITY & SABINE.—The Interstate Commerce Commission, after a rehearing, has issued a certificate authorizing this company to build an extension from Weldon to Waco, Tex., 109.3 miles, one from Livingston by way of Beaumont to Port Arthur, Tex., about 100 miles, and a belt line through the southern and southwestern parts of the city of Beaumont, the line south of Beaumont to be built only in the event the company is unable to effect arrangements on terms satisfactory to it for the use of existing rail and terminal facilities in the Beaumont-Port Arthur district and at Port Arthur. On September 19, 1925, the commission authorized part of the proposed construction on condition of the company's being unable to obtain trackage rights over existing lines and the company applied for a rehearing and submitted an amended application. Commissioner Woodlock, in a dissenting opinion, said that the main argument in support of the new construction is that it is alleged to be necessary in order that the existing mileage of the company may be able to maintain itself and that a solution of the short-line problem through consolidation appears to him to be "much more in accord with the public interest than an attempt to maintain existing mileage which is not self-supporting by new construction which in turn will probably not create its own means of support."

Union Station Ordered in Los Angeles

The Railroad Commission of California has issued an order directing the Southern Pacific, the Union Pacific, the Atchison, Topeka & Santa Fe and the Pacific Electric to unite in the construction of a union passenger station and terminal in the Plaza area at Los Angeles, Cal. Under the terms of this order the railroads involved must complete construction of the station within three years after the verification of the findings of the state commission by the Interstate Commerce Commission, while construction must be started within 90 days of the same date. The Southern Pacific is directed to abandon all but industrial switching movements on its line on Alameda street, between College and East Fifteenth streets.

The Terminal Railroad Association of St. Louis, Mo., has launched a three months' advertising campaign to acquaint the general public with the facilities afforded the shippers of St. Louis by the terminal.

Railway Finance

ATLANTA & ST. ANDREWS BAY.—Notes Authorized.—The Interstate Commerce Commission has authorized this company to issue \$63,114 two-year promissory notes representing notes in excess of 5 per cent of the carrier's outstanding securities, which notes had been issued without the commission's authorization, and which are, therefore, held by the commission to be void.

BANGOR & AROOSTOOK.—Stock.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,468,000 of additional common stock to partially reimburse the treasury for expenditures from income, to be offered to stockholders at \$60 a share (par value \$50).

CANADIAN PACIFIC.—Lease.—That portion of the St. Johnsbury & Lake Champlain between St. Johnsbury and South Lunenburg, 22 miles, has, subject to the approval of the Interstate Commerce Commission, been leased to the Canadian Pacific for a period of 10 years, effective August 1, on which date the Maine Central will give up its lease of that portion of the property.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to nominally issue and pledge \$927,000 of first and general mortgage gold bonds.

CHICAGO, MILWAUKEE & ST. PAUL.—Reorganization.—The United States Circuit Court of Appeals on July 22, at Chicago denied the appeal of the Jameson committee of junior bondholders of this company from the terms of the reorganization plan as approved by Federal District Judge James H. Wilkerson. The reorganization plan was approved several months ago by Judge Wilkerson, and the objecting committee represents 70 holders of \$18,000,000 of the general and refunding mortgage bonds who have refused to deposit their securities under the plan. The court found no suggestion of coercion of bondholders to deposit bonds nor was there anything in the record indicating any unlawful deprivation of dissenting bondholders of a hearing upon the issues at the sale of the property. The court also stated that after the sale was made and the plan presented to the district court an opportunity was afforded for any objection to the plan, but none was presented. The decision also pointed out that 85 per cent of the bonds were deposited in favor of the plan while only 8 per cent were opposed to it. "While in such matters the majority does not govern, the approval thus signified by this vastly greater number, whose interests are identical in kind with those of the objectors, it is entitled to much weight in determining whether the plan is equitable and fair."

DELAWARE, LACKAWANNA & WESTERN.—Securities Company Plan Rejected.—The

Interstate Commerce Commission has adopted the recommendations of its examiners, reported in the *Railway Age* of June 25, that the Lackawanna should be refused permission to dispose of \$13,635,000 first and refunding mortgage bonds of the New York, Lackawanna & Western and \$10,000,000 Morris & Essex 5 per cent bonds to the proposed Lackawanna Securities Company. The Lackawanna proposed to incorporate the Lackawanna Securities Company and to distribute its shares to stockholders of the railroad company in the ratio of one share of securities company stock to two shares of railroad stock and it proposed to turn over to the securities company, bonds at present held in its treasury aggregating \$92,006,000 par value as follows:

Morris & Essex 3½s of 2000.....	\$9,871,000
Glen Alden Coal Company 4 per cent bonds	58,500,000
Morris & Essex 5s of 1955.....	10,000,000
New York, Lackawanna & Western 5s of 1973	13,635,000

The issuance of the New York, Lackawanna & Western bonds was authorized by the commission on August 2, 1922, and the issuance of the Morris & Essex \$10,000,000 5 per cent bonds on November 19, 1925. Both these bonds were to be delivered to the Delaware, Lackawanna & Western, lessee, and each order provided that the bonds to be issued should not be sold or pledged by either the issuing company or the Lackawanna unless approved by the commission.

The \$9,871,000 3½ per cent Morris & Essex bonds were issued prior to the passage of the Transportation Act.

The Lackawanna has leases of the New York, Lackawanna & Western and the Morris & Essex in each case for the term of the leased company's corporate existence and renewals thereof, being equivalent to leases in perpetuity. The N. Y. L. & W. owns that part of the Lackawanna's main line from Binghamton, N. Y., to Buffalo, inclusive of the Lackawanna's terminal facilities at the latter point. The N. Y. L. & W. has outstanding \$9,929,600 stock of which the Lackawanna owns \$70,400. Its funded debt consists of the bonds which the Lackawanna proposes to transfer to the new securities company and 10 million of bonds in the hands of the public. The Morris & Essex owns the larger part of the Lackawanna's mileage in New Jersey with the exception of the cut-off and owns the company's terminal properties at tidewater. Its capitalization consists of \$15,000,000 capital stock, only \$250 of which is owned by the Lackawanna and, including the bonds which the Lackawanna proposes to transfer to the securities company, funded debt totaling 5 million dollars. The combined mileage of the two companies is 341 miles; the Lackawanna's owned mileage totals 228. Excerpts from the decision follow:

By disposing of the bonds as proposed, the Lackawanna will increase the funded debt upon which it must pay interest as rental for its leased lines from \$42,611,000 to \$76,117,000,

and its rentals for such leased lines from \$4,418,772 to \$5,946,007. Its situation would then be that of a company having outstanding \$84,441,100 of capital stock and \$121,076,544 of funded debt, upon which it would pay yearly interest of \$5,951,863, or about 4.91 per cent, with a total capitalization aggregating about \$210,000 per mile of road, and \$75,600 per mile of track.

In *Stock of Delaware, Lackawanna & Western R. R.*, we found that the record in that proceeding disclosed no intercorporate relations or other circumstances that would bring the Lackawanna's holdings of stock and bonds of the companies owning the leased lines, including the \$9,871,000 of Morris & Essex first-refunding mortgage bonds, which the Lackawanna now proposes to transfer to the securities company, within the sphere of securities that could properly be capitalized by a common carrier, classifying such securities as flexible or shifting assets. The Lackawanna's leases were not before us, and, so far as appears, the exact nature of the Lackawanna's obligation in respect of the Morris & Essex bonds was not shown.

The facts developed in this proceeding disclose that the Morris & Essex bonds were not properly classified. So long as the Lackawanna holds the bonds in its treasury it is under no obligation to pay either the principal of the bonds or the interest thereon. While its accounts reflect the payment of interest on the bonds as part of its rent for leased roads and the receipt of the interest as part of its income, the transactions are merely a matter of bookkeeping. The Lackawanna's obligation in respect of bonds, as evidenced by its guaranty, will arise when and only when it parts with the possession of the bonds for a valuable consideration. The assumption of obligation and liability takes effect not when the Lackawanna countersigns the bonds, indorses its guaranty thereon, and delivers them to the trustee for authentication, but when it disposes of them.

The same observations are applicable to the Morris & Essex construction-mortgage bond and the N. Y. L. & W. first and refunding mortgage bonds which the Lackawanna proposes to transfer to the securities company. They can not properly be classed as assets. They have, for all practicable purposes, the same status as bonds authenticated and delivered to an issuing company in reimbursement of its treasury for expenditures made from income or other moneys therein. Such securities may be converted into assets, but in such conversion the issuing company must usually incur liabilities in an amount equal to or greater than the amount of the assets received. Other characteristics of these so-called treasury assets indicating that they have the same status as securities of an issuing company held in its treasury are that they do not become valid and binding obligations until countersigned and guaranteed by the Lackawanna and that the latter, in view of the fact that its assumption of obligation and liability does not arise until it disposes of the bonds, can not dispose of them without our authority.

While we have authorized the Lackawanna to assume obligation and liability in respect of the \$10,000,000 Morris & Essex bonds and of the \$13,635,000 of N. Y. L. & W. bonds, such authorization was subject to the reservation that the Lackawanna should not dispose of the bonds unless and until so ordered by us. This reservation was necessary to enable us to complete, as required by section 20a, the investigation of the purposes and uses of the proposed assumption which were not fully disclosed in the proceedings upon the original applications. By its original applications in these proceedings the Lackawanna was not seeking authority to dispose of the bonds in question. It was necessary for the Lackawanna to countersign the bonds and indorse its guaranty upon them before they could be authenticated by the trustees and delivered to the lessors for further delivery to the Lackawanna.

Indorsing the guaranty upon the bonds was a preliminary step in the assumption of obligation by the Lackawanna in respect of the bonds, and the order in each proceeding, so far as it relates to the bonds under consideration, confers upon the Lackawanna only such authority as is necessary to take this step. By its supplemental application the Lackawanna has completed its showing as to the purposes and uses of the proposed assumption, and our further orders authorizing the Lackawanna to complete its assumption of obligation and liability by disposing of the bonds must be based upon findings to be made in accordance with the provisions of section 20a. We must find not only that the proposed assumption is for some lawful object within the corporate purposes of the Lackawanna, and compatible with the public interest, but that it is reasonably necessary and appropriate for such purpose.

The purpose of the proposed assumption is to give validity and additional security to certain obligations of lessor companies in order that the Lackawanna may exchange them for securities of a non-carrier company, thus reimbursing its treasury for expenditures made in retiring

(Continued on page 236)

Annual Report

Great Northern Railway Company

Excerpts from Thirty-Eighth Annual Report

To The Stockholders:

The Board of Directors submits the following report for the year ended December 31, 1926:

Capital Stock

There has been no change during the year in the authorized share capital, which remained at \$250,000,000, and of which there had been issued to December 31, 1926\$249,620,550.

Of this latter amount there was held in the Treasury \$685,600, the amount actually outstanding in the hands of the public being \$248,934,950, an increase of \$18,400 during the year. This increase represents fully paid and issued stock subscribed for at par by residents of the territory served by the new extension west of Scobey, Montana.

Funded Debt

There was an increase of \$13,448,700 in the funded debt, as shown by statement on page 20, made up as follows:

By issue of the Company's General Mortgage 4½ per cent. Gold Bonds, Series "D," dated July 1, 1926, maturing July 1, 1976.....	\$15,000,000	
<i>Less</i>		
The St. P. M. & M. Ry. Co. Consolidated Bonds redeemed through the operation of the Sinking Fund, as per statement on page 21.....	\$6,000	
Notes maturing and paid during 1926, under the various equipment trust agreements	1,545,300	1,551,300
Net increase		\$13,448,700

General Gold Bond Mortgage—Series "D" Bonds

To reimburse the treasury in part for money expended from income or other moneys in the treasury for additions and betterments, construction of new lines, etc., not previously capitalized, there was issued and sold \$15,000,000 principal amount of the Company's General Mortgage 4½ per cent. Gold Bonds, Series "D." These bonds were dated July 1, 1926, bear interest at the rate of 4½ per cent per annum, payable semi-annually on January 1 and July 1 in each year, and mature July 1, 1976. The bonds were sold for cash at 91½ per cent and accrued interest from July 1, 1926, the issue and sale being authorized by the Interstate Commerce Commission by its order dated July 24, 1926.

Purchase of the Inland Empire Properties

The Great Northern has acquired all the physical property of the Spokane and Eastern Railway and Power Company and the Inland Empire Railroad Company, comprising 179 miles of main track and also second track and side track, a total track mileage of 238, the Interstate Commerce Commission having approved this acquisition April 21, 1927. These properties operated independently during the past three years earned an average of \$60,305.93 more than operating expenses. The purchase price was \$1,250,000, although the properties have a reproduction value of approximately \$16,000,000. The lines are excellent feeder branches for the Great Northern, serving the Idaho pine mills at Coeur d'Alene and connecting with tracks serving the mill at Potlatch, Idaho. They also serve the Palouse country, which is one of the most important wheat producing areas in the West.

Unified Operation of Great Northern Railway Company and Northern Pacific Railway Company

The plan proposed for the unification of the Great Northern Railway Company and the Northern Pacific Railway Company was explained to stockholders in letter dated February 1, 1927, and copies of the Plan and Deposit Agreement were mailed on February 15, 1927.

A deposit committee consisting of George F. Baker, Arthur Curtiss James, J. P. Morgan, Louis W. Hill and Howard Elliott was formed with the approval of the Board of Directors of the two Northern Companies. This committee was authorized to receive the stock and proxies under the Deposit Agreement, and to do all things necessary with the Interstate Commerce Commission and others representing the public to make the plan effective.

On July 8, 1927, application was made to the Interstate Com-

merce Commission for authority to lease the properties of the Great Northern, Northern Pacific and Spokane, Portland and Seattle to the Great Northern Pacific Railway Company; and the Deposit Committee stated that more than seventy per cent of the stock had been deposited by the stockholders of the Great Northern and Northern Pacific.

Extension of Lines in Oregon

The Northern Pacific Railway decided not to join in extending the Oregon Trunk Railway from Bend to Klamath Falls, but consented to the Oregon Trunk accepting the terms of the Interstate Commerce Commission's order authorizing the extension, with the understanding that the Great Northern Railway Company would take the line over.

It has been found practicable to purchase the Shevlin-Hixon Railway, extending approximately twenty-five miles south of Bend, which leaves only about forty miles to build to Paunina, and we have been able to arrange for use of the Southern Pacific's line from Paunina to Klamath Falls; also to purchase from the Southern Pacific at cost a one-half interest in the Oregon, California & Eastern (Strahorn Line). Barring delays in securing right of way between the south end of the Shevlin-Hixon line and Paunina, the grade should be ready for track laying within six months and track should be connected up at Paunina early next spring, so that in less than a year the Great Northern should be operating trains into Klamath Falls. The advantage in the arrangement made with the Southern Pacific is that it removes the necessity for duplication of lines in the Klamath Basin, which would have been inevitable had we built our own independent line all of the way from Bend to Klamath Falls.

For the Board of Directors.

LOUIS W. HILL,
Chairman.

July 15, 1927.

Report of President

To the Board of Directors:

SUMMARY OF OPERATIONS FOR THE SIX MONTHS ENDED JUNE 30, 1927

Statistics for the first six months of 1927, 1926 and five-year average, 1922-1926, are given below:

	1927 (June Estimated)	1926	1922-1926 Five-Year Average
Revenue from freight transportation..	\$37,170,000	\$36,567,967	\$35,693,857
Revenue from passenger transportation	6,025,000	5,921,517	6,467,593
Revenue from mail, express and other sources	4,795,000	4,708,567	4,836,533
Total railway operating revenues.....	\$47,990,000	\$47,198,051	\$46,997,983
Railway operating expenses.....	36,665,000	36,007,001	37,760,688
Net revenue from railway operations..	\$11,325,000	\$11,191,050	\$9,237,295
Taxes	4,635,000	4,474,092	4,283,413
Equipment and joint facility rents (credit)	230,000	305,984	647,810
Net railway operating income.....	\$6,920,000	\$7,022,942	\$5,601,692
Other income	*5,920,000	*5,832,835	5,427,236
Total income	\$12,840,000	\$12,855,777	\$11,028,928
Interest and other deductions.....	19,440,000	19,102,263	8,828,198
Balance available for dividends.....	\$3,400,000	\$3,753,514	\$2,200,730
Net railway operating income for twelve months		\$31,280,429	\$25,153,298

*Includes \$4,150,900 dividend from C. B. & Q. stock.

†Includes \$4,025,000 interest on bonds issued for purchase of C. B. & Q. stock.

SUMMARY OF OPERATING INCOME FOR THE YEARS 1926, 1925 AND 1924

ITEM	1926	1925	1924
Average mileage of road operated...	8,188.21	8,242.09	8,251.44
Transportation revenue	\$113,261,096	\$110,963,697	\$107,486,902
Incidental operating revenues.....	4,122,813	3,961,263	2,756,202
Total railway operating revenues.....	\$117,383,909	\$114,924,960	\$110,243,104
Railway operating expenses.....	75,285,464	75,827,288	75,212,059
Net operating revenue.....	\$42,098,445	\$39,097,672	\$35,031,045
Railway tax accruals.....	9,699,807	9,801,946	10,257,741
Uncollectable railway revenues.....	15,339	7,844	12,267
Railway operating income.....	\$32,383,299	\$29,287,882	\$24,761,037
Equipment rents—net	Dr. 808,498	Dr. 726,135	Dr. 304,269
Joint facility rents—net.....	Dr. 294,372	Dr. 285,564	Dr. 255,481
Net railway operating income...	\$31,280,429	\$28,276,183	\$24,201,287
Ratio of expenses to revenues (per cent.)	64.1	66.0	68.2

[ADVERTISEMENT]

The increase in net earnings has been due largely to improvements and additions, such as reducing curves and grades, building new second track, longer passing tracks, and better terminal and shop facilities; and also to improvements in the existing equipment and the acquisition of larger and better locomotives and cars. During the last six years \$93,000,000 has been expended for such additions and improvements to roadway and equipment. The savings from these improvements have to some extent made it possible to handle the increasing volume of business without a corresponding increase in operating expenses.

Revenues per net ton mile, years 1917 to 1926, have been as follows:

Calendar Year	Revenue (Cents)
1917	.766
1918	.870
1919	.970
1920	1.054
1921	1.301
1922	1.134
1923	1.070
1924	1.064
1925	1.058
1926	1.048

Freight Traffic

A synopsis of the tons of freight moved and revenue received for the years 1926 and 1925 is given below.

COMMODITY	1926		1925		INCREASE—I DECREASE—D	
	TONS	GROSS REVENUE	TONS	GROSS REVENUE	TONS	GROSS REVENUE
Products of agriculture.....	5,288,954	\$24,906,209	5,863,719	\$25,443,220	D 574,765	D \$537,011
Animals and products.....	605,268	4,770,466	601,555	4,539,880	I 3,713	I 230,586
Product of mines.....	21,125,011	20,114,477	19,344,117	18,986,609	I 1,780,894	I 1,127,868
Products of forests.....	4,106,394	15,909,305	4,028,387	15,545,354	I 78,007	I 363,951
Manufactures and miscellaneous.....	3,992,302	27,646,283	3,656,842	25,583,700	I 335,460	I 2,062,583
Total	35,117,929	\$93,346,740	33,494,620	\$90,098,763	I 1,623,309	I \$3,247,977

Drought and heat in the early summer and excessive moisture during the threshing season caused a decrease in the 1926 grain crop. Shipments of apples in 1926 increased 3,000 cars, resulting in a corresponding increase in revenue of over \$1,000,000. The revenue from iron ore also increased over \$1,000,000, the movement in 1926 amounting to 14,667,029 long tons, or an increase over 1925 of 1,448,862 long tons. In manufactures and miscellaneous substantial increases were shown in the movement of refined petroleum and its products and in bar and sheet iron, structural iron, etc. An analysis of the number of cars and tons of freight traffic, by commodities, is shown on page 28.

Passenger Traffic

The local or short haul railway passenger business is decreasing as indicated by the increase in average miles per passenger and the decrease in the passenger train miles. For the past four years these statistics have been as follows:

Year	Average Miles Carried Revenue Passengers	Passenger Train Miles
1923	92.49	11,617,755
1924	107.18	11,530,198
1925	121.20	11,402,206
1926	132.90	10,990,174

Improvement of public highways and the consequent increase in travel by private automobiles and motor buses account for the continuing decline in passenger traffic.

The process of consolidating the several bus companies purchased into one, known as the Northland Transportation Company, has progressed during the year 1926. The operation of this Company accounts largely for the reduction in passenger train miles.

The Northland Transportation Company handled 1,975,024 passengers in 1926. The elimination of duplicate service either on the railway or the highway paralleling the railway is practicable through the ownership of the Northland Transportation Company and will be continued as circumstances warrant.

Oil Development in Montana

The oil industry development has continued in the Kevin-Sunburst field, located on the Company's line. At the close of the year 1926, there were 670 producing wells, 63 producing gas wells, 23 wells drilling and 35 rigs up on locations. Oil well operators expect that the 1927 drilling program will be the largest experienced in this field to date. During 1926 this field produced 6,100,000 barrels of crude oil, or a weekly average of over 117,000 barrels as compared with 54,000 barrels in 1925. Nearly one-third of this production was used by this company for locomotive fuel in its western territory. The Great Northern uses oil for locomotive fuel on the main line from Williston, North Dakota, to Seattle, Washington, a distance of 1,179 miles. It is ideal for such purpose, especially on account of the absence of cinders. Passengers find this an added travel comfort of great importance.

Immigration and Agricultural Development

The construction of the Beaver Creek dam in the Sun River Canyon, Montana, has been started, and when completed, will afford a plentiful supply of water for land now being cultivated, and will bring about 40,000 additional acres under cultivation. Special efforts are being made to secure farmers experienced in farming irrigated lands. The campaign for home-seekers is being continued. The agricultural opportunities in the northwest states were placed before 500,000 people in the central states by exhibits of agricultural products. During the year 500 pure bred sires, 1,084 dairy cows and over 50,000 sheep were placed on farms in Minnesota, North Dakota and Montana. Diversified farming is beginning to show results, and there is a constant increase in the production of wool, mutton, butter and livestock, and in the acreage of alfalfa, sweet clover and corn. The beet sugar industry is increasing, the factories at East Grand Forks, Minnesota, Sidney and Chinook, Montana, and at Bellingham, Washington, produced a total of 435,000 bags of sugar in 1926.

Western Fruit Express Company

The perishable freight traffic on the system continues to be operated successfully by the Western Fruit Express Company, a subsidiary of the Great Northern. Traffic arrangements entered into with the Western Fruit Express Company and the

Fruit Growers' Express Company, which companies control and operate 24,000 refrigerator cars, afford an ample supply of cars at all times. The fruit movement in Great Northern territory comes later in the year than the fruit movement in the southeastern territory served by the Fruit Growers' Express, so that the interchange of refrigerator cars between the respective companies is an advantage to both. This arrangement has been in effect since September 1, 1923, and will be continued. During the year the Chicago, Burlington & Quincy Railroad organized the Burlington Fruit Express Company, which is similarly operated.

Maintenance of Track, Structures and Equipment

The expenditure for maintenance in 1926 for both way and equipment amounted to \$31,996,875, compared with \$31,498,206 in 1925 and \$30,990,854 in 1924. The high standard of maintenance which has been carried on during the past several years has brought about a constantly improving condition of physical property; roadway and structures being in excellent condition as the result of laying 130-lb. and 110-lb. rail, applying washed ballast and in every other way conforming to the most rigid requirements as to materials and workmanship.

The cost of material such as ties has been increasing. On the other hand, the use of more labor-saving equipment on the line and tools in the shops has increased the effectiveness of labor. The large number of treated ties now in track and the almost exclusive use of treated ties will result in a large saving in track maintenance within the next five years.

In the case of maintenance of equipment, the total charges increased in 1926 as a result of the retirement of a large number of obsolete locomotives and freight cars.

The satisfactory condition of the equipment is evidenced by the fact that on October 1, 1926, the percentage of locomotives awaiting shop was reduced to 11.6% and the percentage of bad order freight cars on the line was only 4.8% compared with 13.4% and 5.8% respectively, for the same period in 1925.

Change of Line and Electrification in Cascade Mountains

Reference was made in the 1925 annual report to the change of line and electrification in the Cascade Mountains. The change of line involving a 7.79 mile tunnel (the longest on the American Continent) has been prosecuted vigorously during the year and all prior records for speed in advancing a tunnel heading in rock have been broken. In October, 1926, the 8x9 pioneer heading from the west end of the tunnel was advanced 1157 feet, the best previous record being 932 feet in a 6½ x 8 pioneer tunnel on the Canadian Pacific Railway at Rogers Pass in 1913. On July 1, 1927, the primary penetration from the east and west ends had advanced a total of 30,844 feet, leaving 10,298 feet remaining to be penetrated. It is expected that the entire tunnel will be completed during the year 1928. Respectfully submitted,

RALPH BUDD,
President.

[ADVERTISEMENT]

Railway Finance

(Continued from page 233)

existing obligations of the lessor companies and in making additions and betterments to their properties, and distribute to its stockholders as a dividend securities received in exchange for those guaranteed. The transactions proposed are tantamount to a distribution of the Lackawanna's own bonds as a dividend.

In *Stock of Chicago, Burlington & Quincy* we denied an application for authority to issue mortgage bonds as a dividend against surplus, holding that the issue had not been justified upon the record. In that case it was found that the issue of bonds would increase the carrier's interest burden without apparent necessity, and that division of that part of its surplus not needed for ordinary surplus purposes by means of stock appeared more in accord with the welfare of the applicant and the public. In refusing the authority requested, we stated that the denial extended only to the issue of a bond dividend by a railroad which had no need for bonds, and which could advantageously issue all the stock reasonably required for its needs.

The disposition of bonds by the Lackawanna as proposed would materially increase its interest burden without apparent necessity. The only plausible argument advanced by the Lackawanna for distributing a part of its surplus as proposed, and thereby increasing its fixed charges, is that such distribution would make its stock more attractive as an investment and put the Lackawanna in position to make more advantageous terms in case of consolidation of its properties with those of other carriers. While such result might follow the distribution of treasury assets such as the Glen Alden Coal Company bonds, reducing corporate surplus by increasing the funded debt and interest charges of the system might well be expected to produce results contrary to those desired.

As has been pointed out, both the Morris & Essex and the N. Y., L. & W. are very important members of the Lackawanna system. Should the Lackawanna dispose of the bonds of those companies as proposed, its investment in them would be represented by \$70,400 of N. Y., L. & W. stock out of a total of \$10,000,000 outstanding, \$250 of Morris & Essex stock out of a total of \$15,000,000 outstanding, and advances to those companies in the amounts of \$2,119,374 and \$6,675,526, respectively. While it is true that the Lackawanna holds these properties under leases that are equivalent to leases in perpetuity, its tenure depends on its ability to maintain its earnings at a point sufficient to pay dividends on the stock and interest on the bonds of the lessor companies at the rates fixed in the leases. By its proposal in these proceedings the Lackawanna has evidenced an intention of adopting a financial policy that would constantly increase the funded debt of the lessor companies, and the fixed charges that must be paid in respect thereof, while imposing no fixed charges on properties owned outright. The tendency of this policy is indicated by the fact that the present ratio of securities upon which it must pay dividends only out of income or accumulated surplus to securities upon which it must pay dividends and interest as fixed charges is approximately 0.96, whereas, should the bonds of the lessor companies be disposed of as proposed, the ratio would be reduced to approximately 0.70. Should this policy be continued, it is entirely within the realm of possibilities that the Lackawanna may lose control of essential parts of its system, should prolonged periods of stress because of strikes, or other causes, reduce the Lackawanna's earnings to the point where they would be insufficient to pay the rentals.

See article in the *Railway Age* of April 9, 1927, entitled "Delaware, Lackawanna & Western."

DETROIT & MACKINAC.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing the Detroit & Mackinac to abandon its Au Sable River branch extending from Oscoda, Iosco County, Mich., to Comins, Oscoda County, 50.6 miles, with a branch extending from Hardy to Curran, 4.58 miles, a total of 55.18 miles. The explanation is lack of traffic. Action on an application for authority to abandon the company's Rose City branch and on a supplementary application with reference to the abandonment of the Lincoln branch was deferred.

DETROIT, TOLEDO & Ironton.—Settlement with Minority Stockholders.—H. H. Nordlinger of the law firm of Nordlinger

& Riegelman, 67 Wall Street, New York, who represented Martha Nordlinger and the estate of Edwin H. Nordlinger opposing the sale of the Detroit, Toledo & Ironton to the Detroit & Ironton, has announced that a settlement has been made with Mr. Ford. It is said that the stock has been sold to Mr. Ford as a price substantially above the \$104 a share which would have been yielded by Mr. Ford's plan, which was rejected by the Interstate Commerce Commission whereby the Detroit & Ironton was to acquire the entire ownership of the Detroit, Toledo & Ironton. The Nordlinger interests are reported to have held 433 shares of common and 33 shares of preferred stock. Another group of minority stockholders representing Benjamin M. Strauss and the estate of Leon Tannebaum, which is reported to hold 297 shares each of common and preferred, is understood not to have come to any settlement.

LONG ISLAND.—Equipment Trust.—The Interstate Commerce Commission has authorized the issuance of \$3,765,000 4½ per cent equipment trust certificates, series 1, covering the purchase of 241 passenger train cars, having a total approximate cost of \$5,026,137. The company asked for bids from 27 banking houses and 8 bids were received representing 19 firms. The highest bidder was the Mellon National Bank of Pittsburgh which bid 99.391, giving an average annual cost to the carrier of approximately 4.596 per cent.

MANISTIQUE & LAKE SUPERIOR.—Sale.—This company will be sold at auction for delinquent taxes on August 4 by Auditor-General Oramel B. Fuller. This will be the second time that the road has been sold for taxes, the first time being in 1910.

NEW YORK CENTRAL.—Hearing on Tentative Valuation.—The Interstate Commerce Commission has assigned the protests against its tentative valuation reports covering the properties of the New York Central and affiliated companies for hearing on August 18 before Examiner Kephart.

PHILADELPHIA, BALTIMORE & WASHINGTON.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and deliver to the Pennsylvania \$3,822,000 of general mortgage 4½ per cent bonds, in partial reimbursement of indebtedness due the Pennsylvania as lessee.

PITTSBURG, SHAWMUT & NORTHERN.—Securities Authorized.—The Interstate Commerce Commission has authorized the issuance of \$2,044,350 of receiver's certificates and a promissory note of \$322,000, each paying 6 per cent and each maturing in two years. The proceeds are to be used in part to retire similar securities which have matured.

SOUTHERN PACIFIC.—Equipment Trust.—The Interstate Commerce Commission has authorized the issuance of \$5,786,000 4½ per cent equipment trust certificates, series J, covering the purchase of 12 locomotives, 2,450 freight train cars, 111 passenger train cars, 1 steam locomotive crane, 1 gasoline crane, 10 dump cars, 1 spreader and a rotary snow plow, having a total approximate cost of \$8,905,646.

Bids for the proposed issue were solicited from 34 banks and 8 bids were received representing 16 banks. The commission approved the sale to the highest bidders, the Mellon National Bank of Pittsburgh and Salomon Brothers & Hutzler of New York City at 99.52, giving an average annual cost to the carrier of approximately 4.561 per cent.

TENNESSEE CENTRAL.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell at not less than 95, \$410,000 of its first mortgage 6 per cent bonds, the nominal issue of which had been previously authorized to reimburse the treasury for expenditures from income.

TEXAS & NEW ORLEANS.—Abandonment.—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon a branch line from a connection with its Beaumont-Dallas line at Rockland, Tyler County, Tex., to Turpentine, Jasper County, 10.5 miles.

WESTERN MARYLAND.—Bonds.—The Interstate Commerce Commission has authorized an issue of \$12,000,000 of first and refunding mortgage 5½ per cent bonds, to be sold at 96½, the proceeds to be used in paying outstanding notes and for additions and betterments.

WESTERN MARYLAND.—Tentative Valuation.—The Interstate Commerce Commission's tentative valuation report, as of 1919, finds the final value for rate making purposes of the property owned and used for common-carrier purposes to be \$71,219,111, while that of the property used is placed at \$74,151,827. The outstanding capitalization as of valuation date was \$138,693,955 and the investment in road and equipment was stated in the company's books as \$127,143,001.

WICHITA FALLS, RANGER & FT. WORTH.—Capital Stock Increase.—An amendment to the charter of this company providing for an increase in capital stock from \$120,000 to \$1,000,000 has been approved by the attorney general's department of the State of Texas and filed with the secretary of state.

Dividends Declared

International Railway of Central America.—Preferred, 1½ per cent, quarterly, payable August 15 to holders of record July 30.

Average Price of Stocks and Bonds

	Last	Last
	July 26	week
Average price of 20 representative railway stocks..	117.94	117.31
Average price of 20 representative railway bonds..	94.09	94.01
		90.81

Valuation Reports

The Interstate Commerce Commission has issued tentative valuation reports finding the final value for rate-making purposes of the property owned and used for common-carrier purposes, as of the respective valuation dates, as follows

TENTATIVE REPORTS		
Skaneateles	\$215,800	1918
Sioux City Terminal	347,241	1918
St. Louis Merchants' Bridge		
Terminal (used 8,511,264) ..	3,549,273	1919
Western Maryland	71,219,111	1919

Railway Officers

Executive

Eugene Fox, vice-president of the Western Pacific in charge of traffic, with headquarters at San Francisco, Cal., has also been elected vice-president of the Sacramento Northern and the Tidewater Southern, in charge of traffic.

C. L. Bradley, vice-president of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has also been elected president of the Cleveland Union Terminals Company, succeeding **O. P. Van Sweringen**, resigned.

W. C. Sloan, who has been appointed assistant to the vice-president in charge of operation of the Northern Pacific, with headquarters at St. Paul, Minn., was born on July 9, 1886. After attending Cornell University, Mr. Sloan entered the service of the Pennsylvania as an inspector on the New York tunnels in February, 1907. During 1908 he was employed by the Brooklyn Rapid Transit Company, entering the service of the Northern Pacific on April 1, 1909, in the engineering department. Mr. Sloan occupied a number of positions in the engineering department for the next six years and at the end of that time he was transferred to the operating department as a trainmaster at Forsyth, Mont.



W. C. Sloan

In 1917, just before the entry of the United States into the world war when he served overseas as a captain in the army. Mr. Sloan was promoted to division superintendent, with headquarters at Pasco, Wash. He returned to the N. P. as division superintendent in 1919, serving successively in that capacity on the Rocky Mountain, Pasco, Yellowstone and Lake Superior divisions. At the time of his appointment as assistant to the vice-president on July 15, Mr. Sloan had served since 1925 as

superintendent of the Lake Superior division, with headquarters at Duluth, Minn.

Operating

R. L. Barrett, trainmaster on the Pittsburgh & West Virginia and the West Side Belt at Pittsburgh, Pa., has been appointed superintendent, with headquarters at Rook, Pa.

W. R. Lence, executive general agent of the Texas & Pacific, with headquarters at Dallas, Tex., has been appointed general manager of the Abilene & Southern, with headquarters at Abilene, Tex.

J. S. Crews has been appointed general superintendent of the Jacksonville, Gainesville & Gulf, with headquarters at Gainesville, Fla., and Macon, Ga. **H. W. Waits** has been appointed superintendent, with headquarters at Gainesville, Fla.

J. W. Sexton, district engineer maintenance of way of the Southern district of the Seaboard Air Line, with headquarters at Arcadia, Fla., has been appointed assistant trainmaster of the North Carolina division, with headquarters at Hamlet, N. C.

T. L. Young, supervisor of service on the Logansport division of the Pennsylvania, at Logansport, Ind., has been appointed acting assistant trainmaster, with headquarters at the same point. **C. C. Arrick**, division operator on the Logansport division, has been promoted to assistant trainmaster, with headquarters at Logansport.

D. H. Lusk, assistant manager of dining cars, hotels and restaurants of the Southern Pacific (lines in Texas and Louisiana), with headquarters at Houston, Tex., has been appointed manager of dining car service on the same lines, with the same headquarters, effective August 1, and the positions of manager and assistant manager of dining cars, hotels and restaurants have been abolished.

R. T. Taylor, assistant superintendent of the Northern Pacific, with headquarters at Billings, Mont., has been appointed superintendent of the Yellowstone division, with headquarters at Glendive, Mont., succeeding **O. F. Ohlson**, who has been transferred to the Lake Superior division, with headquarters at Duluth, Minn. **J. A. Mercer**, trainmaster at Livingston, Mont., has been appointed assistant superintendent, succeeding Mr. Taylor, and Mr. Mercer has been replaced by **Theodore Harris**, trainmaster at Staples, Minn. **Norman Slade**, assistant trainmaster at Helena, Mont., has been appointed trainmaster at Jamestown, N. D., succeeding **B. F.**

Riggs, transferred to Staples to replace Mr. Harris. All appointments are effective August 1.

Willoughby H. Cheney, who has been appointed superintendent of the Southern, with headquarters at Spartanburg, S. C., was born on August 18, 1886, at Commerce, Ga., and was educated in high school. He entered railway service in January, 1902, with the Southern, and from that time until June, 1902, was student telegrapher. From June, 1902, until September, 1903, he was extra agent-operator and from the latter date until February, 1912, was agent on the Charlotte division. Mr. Cheney was superintendent of the Lawrenceville Branch Railroad from February, 1912, until January, 1919, and then became inspector of agencies, Charlotte division, which position he held until June, 1923. From June, 1923, until the time of his recent appointment as superintendent, Mr. Cheney was trainmaster on the Columbia, Charleston and Charlotte divisions.

Thomas A. Norris, who has been appointed superintendent of the Seaboard Air Line, with headquarters at Charleston, S. C., was born on December 6, 1884, at Waverly, Va. He entered railway service in May, 1901, with the Norfolk & Western. In January, 1903, he went with the Southern as extra telegraph operator and agent, Norfolk division. He left the service on April 1, 1903, to accept service with the Seaboard Air Line as telegrapher on the Virginia division at Richmond on April 3, 1903. In May, 1906, he was appointed train dispatcher at Richmond, and in June, 1914, was advanced to chief dispatcher at the same place. In August, 1920, Mr. Norris became trainmaster of the South Carolina division, with headquarters at Savannah, Ga., and in May, 1923, was transferred to the North Carolina division in the same capacity at Hamlet, N. C., which position he held until the time of his recent appointment as superintendent of the East Carolina division. During 1917 he served for three months with the Commission on Car Service as inspector, engaged in special work in the Southeastern States. In 1918 he served for four months with the District Supply Division, Emergency Fleet Corporation, Philadelphia and Richmond.

Financial, Legal and Accounting

F. M. Gilbough, assistant tax commissioner of the Missouri-Kansas-Texas, has been appointed assistant land and tax commissioner of St. Louis-San Francisco, with headquarters at St. Louis, Mo.

John T. Ludlum, who has been appointed freight claim agent of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., was born on February 4, 1886, at Minneapolis. He graduated from the University of Minnesota in 1887, enter-

ing railway service with the Northern Pacific in May, 1893, as an expense clerk in the local freight station at Minneapolis. He remained with the Northern Pacific as expense clerk, as collector and



John T. Ludlum

as assistant cashier until November, 1897, when he was appointed assistant cashier of the local freight station of the Minneapolis & St. Louis at Minneapolis. In May, 1899, Mr. Ludlum engaged for a few months in a private business venture, returning to railroad service in December of the same year as an over, short and damage clerk in the freight claim department of the Soo line at Minneapolis. Early in 1900 he became a freight claims investigator, being advanced to chief clerk of the freight claim department in 1909. In 1912, Mr. Ludlum was appointed assistant freight claim agent, with headquarters at Minneapolis, a position he held continuously until his further advancement to freight claim agent on July 1.

Traffic

F. L. Jones, district passenger agent for the Illinois Central, with headquarters at Houston, Tex., has been transferred to New Orleans, La.

A. H. Merck, assistant division freight agent for the St. Louis Southwestern, with headquarters at Little Rock, Ark., has been appointed assistant general freight agent, with headquarters at the same point.

E. A. Klippel, Jr., city passenger agent for the Union Pacific system at Portland, Ore., has been promoted to general agent in the passenger department, with headquarters at the same point, and the position of city passenger agent has been abolished. **J. V. Carroll**, general agent for the Union Pacific System, with headquarters at San Pedro, Cal., has been transferred to Riverside, Cal., succeeding **F. E. Middleton**, deceased. **W. F. Nash, Jr.**, has been appointed general agent at San Pedro, succeeding Mr. Carroll.

Bode K. Smith, assistant freight traffic manager of the Western Pacific, with headquarters at San Francisco,

Cal., has been appointed passenger traffic manager of the Western Pacific, the Sacramento Northern and the Tidewater Southern, with headquarters at the same point, a newly created position. **J. L. Scott**, general passenger agent of the Western Pacific, with headquarters at San Francisco, has also been appointed general passenger agent of the Sacramento Northern and the Tidewater Southern. **John C. Stone** has been appointed assistant general freight and passenger agent, with headquarters at Sacramento, Cal. Mr. Smith was born on August 2, 1883, at San Francisco and after attending the San Francisco public schools he entered railway service at the age of 15 in the traffic department of the Denver & Rio Grande. For the next 14 years Mr. Smith served the Denver & Rio Grande and other Gould lines successively as city passenger agent, traveling passenger agent and division passenger agent. On August 1, 1916, he was appointed general passenger agent of the Western Pacific, with



B. K. Smith

headquarters at San Francisco, where he remained until June, 1925, when he was promoted to assistant traffic manager. Mr. Smith's title was changed to assistant freight traffic manager in January, 1927, a position he held until his appointment as passenger traffic manager, effective June 20.

Clarence E. Jefferson, who has been promoted to assistant freight traffic manager of the Western lines of the Canadian Pacific, with headquarters at Winnipeg, Man., was born on September 6, 1889, at Boston, Mass. He entered railway service at the age of 17 as an office boy in the Canadian Pacific Despatch office at Boston. Mr. Jefferson occupied successively the positions of billing, tracing and tariff and percentage clerk until November, 1911, when he became a tariff clerk on the Boston & Maine at Boston. Later he performed the same work at Boston for the Maine Central and the New York, New Haven & Hartford. In March, 1913, he was appointed a percentage clerk on the Canadian Pacific at Montreal, Que., being advanced to assistant general freight agent, with headquarters at the same point, in December,

1915. In June, 1921, Mr. Jefferson was appointed acting general freight agent of the Eastern lines of the C. P. R. His promotion to general freight agent became effective in December of the



C. E. Jefferson

same year, with headquarters at Winnipeg, a position he held continually until his further promotion to assistant freight traffic manager.

Engineering, Maintenance of Way and Signaling

C. J. Swane, assistant engineer on the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis., has been appointed division engineer, with headquarters at Miles City, Mont.

R. P. Long, supervisor on the Wabash, with headquarters at Chicago, has been promoted to division engineer, with headquarters at the same point, succeeding **S. N. Crowe**, who has been transferred to Moberly, Mo.

E. W. Everett, designing engineer of the New York Central's Grand Central Terminal, with headquarters at New York, has been appointed assistant terminal engineer, Grand Central Terminal, and the position of designing engineer, Grand Central Terminal, has been abolished.

H. M. Hockman, assistant engineer on the Clover Leaf district of the New York, Chicago & St. Louis, with headquarters at Frankfort, Ind., has been promoted to division engineer on the Nickel Plate district, with headquarters at Cleveland, Ohio, succeeding **W. H. Burrage**, deceased.

A. H. Sturdevant, assistant engineer in the office of the district engineer of the Chicago, Rock Island & Pacific at El Reno, Okla., has been promoted to division engineer of the Panhandle division, with headquarters at the same point, a newly created position.

Obituary

C. J. Scribner, assistant engineer of scales of the Chicago, Burlington & Quincy, with headquarters at Chicago, died in that city on July 13.